

MARCH
1952

INNOVAL BEST FOR ALL ELECTRONIC APPLICATIONS

Amateur Radio

JOURNAL OF
THE WIRELESS
INSTITUTE OF
AUSTRALIA

For the Experimenter
and Radio Enthusiast



9.
D.



PHILIPS

INNOVAL

"HAM" RADIO SUPPLIERS

(KEN MILLBOURN, PROP.)

5A Melville Street, Hawthorn, Victoria

East Kew Tram Passes Corner, opposite Vogue Theatre.

Money Orders and Postal Notes payable North Hawthorn P.O. Packing Charge on all goods over 10 lbs. in weight, 5/- extra.

Phone: Hawthorn 4465

New Valves Just Arrived

807, Nat. Union	£1	5BP1, Sylvania	£1	954 American	12/6	EF50	12/6
830B, R.C.A.	£1	35T Eimac	£4	955	"	RL7	12/6
834, R.C.A.	£1					RL18	13/-

Tested Valves from Disposal Gear

1G4	7/6	6C6	7/6	6K7G	7/6	6U7G	7/6	12SG7	10/-	45	10/-
1K7	7/6	6C8	7/6	6L6G	15/-	12A6	10/-	12SJ7	10/-	813	60/-
1L5	7/6	6F5	10/-	6L7	10/-	12AH7	10/-	12SK7	10/-	832	50/-
2A3	15/-	66G6	10/-	6SC7	10/-	12C8	10/-	12SQ7	10/-	956	10/-
6A3	15/-	6H6	5/-	6SH7	5/-	12H6	10/-	12SR7	10/-	9004	10/-
6AC7	15/-	6J5GT	10/-	6SS7	10/-	12J5	10/-	1629	10/-	7193	5/-
6B5		7/6								VR65A	5/-

JUST ARRIVED—HUGE STOCK OF 6SH7s & 7193s - - 5/- FOR THAT V.H.F. EQUIPMENT! NEW RL18s 13/- EACH

Command Transmitters, 2.1 to 3 Mc. and 4 to 5.3 Mc. Complete with Valves £7/10/- each

TA12D Transmitter, complete with Valves £17/10/-

Type 108 Mark 3. Freq. coverage 2.5 to 3.5 Mc. Easily converted to Ham Band. Complete with Aerial, Phones and Microphone £9

MN26C Radio Compass Receivers, 150 to 1500 Kc. These are new, in carton. Complete with Valves, £17/10/-

Command Receivers, 1.5 to 3 Mc., 3 to 6 Mc., and 6 to 9 Mc. Complete with Valves £7/10/- each

New I.F.F. Units, BC966A. Contains seven 6SH7s, three 7193s, four relays. These sets are complete with 18 volt generator, £5/17/6. Less generator, £4/17/6

A few second-hand BC966A Units are available with the generator, £4/17/6. Less generator, £3/17/6

0-500 Microamp. Meters, disposals equipment 22/6

New Meters—0-1 Ma. full scale, square type 27/6

New Meters—0-5 Ma. full scale, square type 27/6

New Meters—0-40, 0-120 Ma. separate connection, 22/6

New Meters—0-150 Ma. full scale, square type 27/6

813 Ceramic Sockets 15/- each

Six volt Bayonet Type Dial Lamps 1/- each

EF50 Sockets, Ceramic 2/6 each

Locktail Sockets 1/6 each

Chassis Feed Through Insulators 9d. each

Kingsley KS9 with 6AG5 Valve, 14 and 28 Mc. Coll Boxes £6

Kingsley FM Adaptor, 455 Kc. Transformer, Complete with valves £4

Palec Valve Tester, ET3. Complete with Book. £27/10/-

TR1143 English equivalent of American SCR522. This set complete with valves £12/10/-

Philips' Amplifier, 25 watt. Pre-amp, stages and (three 6J7s) into four 6V6 Valves (push-pull parallel), multi-match output transformer, 230v. a.c. operation. Complete with Astatic Xtal Microphone and 12 inch Speaker, £25

Steane's 5 watt Amplifier. Operates off 6 volt d.c. or 230 volt a.c. Line up two stages of 6J7 pre-amps into 6V6 multi-tap output transformer. Less speaker and mike, £15

Hammarskjold plug-in coil units, contains two variable condensers, coil formers, etc. Price £3/10/-

LARGE STOCK OF CRYSTALS JUST ARRIVED

WRITE FOR YOUR REQUIREMENTS

1,000 Kc. Crystal mounted in case with 10 pin valve socket and 4 pin Continental power plug £2

Marker Crystals, 3.5 Mc., 5 Mc. and 10 Mc. Crystals ground to any frequency. Complete with holder, £2.

Following is a list of Crystal Frequencies available for immediate delivery at £2 each:—

3500 Kc. 3595 Kc. 7128.3 Kc. 8043.5 Kc.

3501.6 Kc. 7002.5 Kc. 7129 Kc. 8056.5 Kc.

3506.1 Kc. 7003 Kc. 7130 Kc. 8081.5 Kc.

3509.1 Kc. 7004 Kc. 7132 Kc. 8090 Kc.

3509.2 Kc. 7006.2 Kc. 7140 Kc. 8150 Kc.

3511.2 Kc. 7012.5 Kc. 7177 Kc. 8153.71 Kc.

3514 Kc. 7013 Kc. 7179 Kc. 8161.538 Kc.

3517 Kc. 7029 Kc. 8019.5 Kc. 8171 Kc.

3335 Kc. 7032 Kc. 8021.5 Kc. 8182 Kc.

3557.5 Kc. 7039 Kc. 8035 Kc. 8183.5 Kc.

3573 Kc. 7052.5 Kc. 8037 Kc. 8218 Kc.

8040 Kc. 8488 Kc.

WANTED TO BUY—RADIO PARTS, VALVES, TRANSFORMERS, RECEIVERS, TRANSMITTERS, ETC.

AMATEUR RADIO

EDITOR:
T. D. HOGAN, VK3HX,
Telephone: UM 1732.

MANAGING EDITOR:
J. G. MARSLAND, VK3NY.

TECHNICAL EDITOR:
J. C. DUNCAN, VK3VZ.

TECHNICAL STAFF:
L. B. FISHER, VK3AFF.

COMPILATION:
R. W. HIGGINBOTHAM, VK3RN.

CIRCULATION:
I. K. SEWELL, VK3IK.

ADVERTISING REPRESENTATIVE:
W. J. LEWIS,
20 Queen St., Melbourne, C.1.
Telephone: MU 5154.

PRINTERS:
"RICHMOND CHRONICLE,"
Shakespeare St., Richmond, E.1.
Telephone: JB 2419.

MSS. and Magazine Correspondence should be forwarded to the Editor, "Amateur Radio," Law Court Chambers, 191 Queen St., Melbourne, C.1., on or before the 8th of each month.

Subscription rate in Australia is 8/- per annum, in advance (post paid) and A10/6 in all other countries.

Wireless Institute of Australia (Victorian Division) Rooms' Telephone is FJ 6997.

Published by the Wireless Institute of Australia,
Law Court Chambers, 191 Queen Street,
Melbourne, C.1.

EDITORIAL

"Please convey to the Royal Family on behalf of members of Wireless Institute of Australia sincere sympathy on passing of His Majesty King George VI."

These few simple words by cablegram to the Royal Family through the office of the Australian High Commissioner in London expressed the sadness in the hearts of all when the news of His Majesty's passing on the morning of 6th February, 1952, was received in Australia.

To every loyal subject, this news came as a sudden and unexpected shock, although we were all aware of the condition of His Majesty's health which necessitated cancelling his Australian Tour.

By his devotion to his people and Empire, King George VI set an example that bears no criticism, but will create a niche in the lineage of the British Monarchy which all the future generations of the British race will look back upon with great respect.

As citizens of the British Commonwealth of Nations we can learn a great lesson from our late King and

thereby further one of his cherished aims in life—"For all classes to learn to know and understand each other better."

The Radio Amateurs of the world—and our Empire in particular—have fine opportunities to implement this understanding.

In mourning his loss, the memory of a Monarch who gave his life in service and duty to his people will be revered by all mankind.

The principles of home life so similarly adhered to by His Majesty and the high example set by his democratic leadership will surely be the foundation on which the British Nation will stand firm forever.

We honour our new sovereign—Queen Elizabeth II—and to her pledge our loyalty as British subjects. Though she is young to shoulder the heavy tasks and responsibilities of a ruling Queen, she has, in her ten years of public life, established herself in the right of her own personality as one of the great individuals of the Royal line who will lead the youth of the Nation to great heights of purpose and achievement.

"GOD SAVE THE QUEEN."

WI BROADCASTS

All Amateurs are urged to keep these frequencies clear during, and for a period of 15 minutes after, the official Broadcasts.

VK3SWI: Sundays, 1100 hours EST, 7196 Kc. and 2000 hours EST 50 and 144 Mc. No frequency checks available from VK3SWI. Intra-State working frequency, 7185 Kc.

VK3WI: Sundays, 1130 hours EST, simultaneously on 3566 and 7196 Kc. and re-broadcast on 50 and 144 Mc. bands. Intra-State working frequency, 7185 Kc. Individual frequency checks of Amateur Stations given when VK3WI is on the air.

VK4WI: Sundays, 0900 hours EST, simultaneously on 3750 Kc., 7196 Kc., 14248 Kc., 68.4 Mc. and 144.13 Mc. Frequency checks are given two nights weekly and the times are announced during Sunday broadcasts. 7053 Kc. channel is used from 1000 to 1030 hours each Sunday as VK4 query service to VK4WL.

VK5SWI: Sundays, 1000 hours EAST, on 7196 Kc. Frequency checks are given by VK5EDW by arrangements only on the 7 and 14 Mc. bands.

VK7WI: Sundays, 0630 hours WEST, on 7196 Kc. No frequency checks available.

VK7WI: Sundays, at 1000 hours EST, on 7196 Kc. and 146.5 Mc. No frequency checks are available.

THE CONTENTS . . .

The "QX"	3	Fifty Megacycles and Above	11
Television Made Easy—Part vii.	4	VK4 Amateurs Hold Convention	12
The Carrier Difference System	4	Hunter Branch's Xmas Party	12
A Simple 12 Watt 144 Mc.	7	Amateur Call Signs	14
Transmitter	9	Federal, QSL, and Divisional	15
Antenna System for General	9	Notes	15
Amateur Use	10	Correspondence	20
"Zone 28 Award" Announced			

Homecrafts

PTY LTD.

BARGAINS FOR THE RADIO ENTHUSIAST!

★ CONVERT YOUR EXISTING 78 R.P.M.
RECORD PLAYER TO "MICROGROOVE"
with the "CHANCERY"

PICK-UP AND TURNTABLE ATTACHMENT



Price as illustrated £12/5/-
Standard or Microgroove Heads, £3/17/6 each.

Will fit any type turntable.
Pick-up suits any Radio Receiver.

- Easy to install.
- Pick-up has interchangeable Heads.
- Cantilever type Sapphire Stylus.
- Excellent Frequency Response.
- Even Speed Reduction.



★ BUILD A DE LUXE
OSCILLOGRAPH

Outstanding value. 5BPI Cathode Ray Tube, originally cost £15, cut to only 25/6. Blue Print to build Oscillograph, 1/8" Socket for 5BPI tube, 9/6. Cathode Ray Cabinet, black crackle finish, steel drilled cabinet and chassis complete with brackets, £4/7/6. Power Transformer for 5BPI Cathode Ray Oscillograph, £4/19/6.

COUNTRY AND INTERSTATE CLIENTS
PLEASE ADD FREIGHT OR POSTAGE.



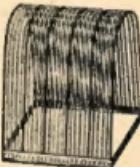
★ BARGAIN ALL-PURPOSE
TEST MULTIMETER

1.000 ohms per volt. Three voltage ranges AC/DC, two milliamper ranges. Resistance up to 200,000 ohms. Self contained battery. Complete with test leads, price only £8/1/- plus 15/6% sales tax.



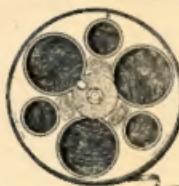
★ BATTERY CHARGER KIT

Kit of parts to build a 6 volt 4 amp. Battery Charger. Kit includes an English Selenium Rectifier, Transformer, black crackle finish metal case, 12 volt 10 amp. power supply, and circuit blue print Instruction. Price, as illustrated, £5/10/-. 12 volt 2 amp. 6/- extra.



★ "RECORDEX" RECORD RACKS

The new improved gramo Record Rack, holds 25 16-in. or 12-in. records. Complete with index card and gummed identification numbers for records. Price, as illustrated, 12/6. Model to hold 50 records, £3/6.



★ TAPE RECORDING EQUIPMENT

Pyral French Recording Tape, the world's best. $\frac{1}{4}$ inch tape with plastic or paper base.
2 inch Spool, Paper Base 28/6
2 inch Spool, Plastic Base 44/-
3 inch Spool, Plastic Base 63/4



★ NEW ZEPHYR "4XA"
CRYSTAL MICROPHONE

High Fidelity Crystal Insert with centre cell filter. Price, £6/5/8.



★ NEW CAPITOL ELECTRIC
GRAMOPHONE UNIT

English Direct Speed Gramo Motor 425-6 and 78 r.p.m., and Collars. High Fidelity Magnetic Pick-up in streamlined leatherette carrying case. As illustrated. £14/19/6.



★ NEW R.P.M. AMPLIFIERS

Two models: Type PA1 turns an ordinary 3-valve receiver into a full-powered gramophone amplifier. Type PA2, for working low output microphone with an ordinary 3-valve receiver. Both models, price £5/15/6.



★ ELECTRIC GRAMOPHONE UNIT

The new B.S.R. three-speed Electric Gramophone Unit, Model GU4, three speeds: 33, 45 and 78 r.p.m. Automatic stop. External knob to change speed. Light weight High Fidelity Pick-up. A Pickup for microgroove or standard recordings. Price as illustrated, 15 Gas. Easy terms available in Victoria.



★ RECORD AND ERASE HEADS

Model L.I., Low Impedance Play Head, with frequency response to 7,000 c.p.s. Suits any type tape. Price as illustrated, 6 Gas.

Model E.I. General Type Erase Head, voltage required 6-8 volts. Frequency 50 to 40 Kc. Price as illustrated, only 6 Gas.

290 LONSDALE STREET, MELBOURNE

Central 4311

THE "QX"

Combining Selectivity, Sensitivity and Simplicity in a New Type I.F. Amplifier

BY K. RUDKIN,* A.M.I.R.E., VK2DG

Have you ever wished for a simple way of improving the gain and selectivity of your receiver without recourse to all those "back-to-back" i.f. transformers, 100 Kc. outriggers, or crystal filters? You have? Well read on brother, this is what you have been waiting for.

Browsing through some copies of "Electronics," I came across an article on a simple Q multiplier. It took but a short time to realise that here was something that could not be overlooked from a Ham point of view, promising as it did tremendous increase in selectivity together with a gain equalising, if not exceeding, that of two conventional i.f. stages and with only one, yes one tuned circuit.

I will admit that at first glance it appeared fantastic that a circuit Q of 15,000 or more could be so easily obtained, but a careful perusal of the article convinced me that this was no fallacy but a very definite fact.

It is neither my desire nor intention to present a series of mathematical formulae proving that "this here" equals "that there," but to prepare this article in such a manner that it is clearly understood by all those readers whose interest is primarily practical. However, if mathematically inclined readers wish to study the derivation of the circuit, I refer them to the original "Electronics" article.

It is well known that the Q or efficiency factor of a tuned circuit is the ratio of reactance to resistance.

Now suppose that in parallel with this circuit there appears a network having a negative resistance characteristic. The negative resistance thus applied tends to reduce or even cancel out the original positive resistance. As the effective resistance therefore becomes less, the circuit Q is greatly multiplied.

Beginning with a tuned circuit already having as high a Q as practical, it is now possible to reach undreamed of values of Q by the comparatively simple method of controlled positive feedback. As an increase of Q also means a proportional increase of selectivity, the high value realised provides us with a corresponding high degree of selectivity.

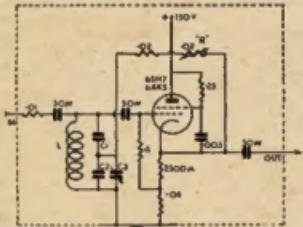
A similar effect is obtained in the ordinary regenerative amplifier or detector circuit, but these, as is well known, lack a most important char-

acteristic, that of stability, the slightest misadjustment or voltage variation causing violent oscillation. Not only this, but the variation of the feedback control invariably produces a corresponding variation in frequency.

The circuit shown in the accompanying Fig. 1 not only provides the necessary feedback to give the effective Q multiplication, but the mean frequency is independent of the feedback control and furthermore the circuit is absolutely free from oscillatory tendencies.

It will be noted that the basis of this circuit is the cathode follower which has the correct phase relation plus a high degree of stability. The cathode follower nevertheless has a gain of less than unity and so to realise an active gain, a further element must necessarily be introduced. This is taken care of by arranging the input circuit to represent an auto-transformer equivalent giving the required step-up in gain to the grid of the valve.

This now means that the circuit shown combines the following desirable characteristics: high selectivity, high gain, absolute stability and simplicity.



The first practical application was made at 1550 Kc., being the first i.f. channel in my communications receiver. The installation however, was temporary only, to discover its possibilities, and I admit that not much care was taken in the construction of the unit, the basis of which was a 6SH7 valve and one winding from a 1500 Kc. i.f. transformer.

Results, however, were beyond expectations, but considerable annoyance was experienced due to the coil being mounted in a shielded compartment already occupied by two valves and the resulting temperature changes as these valves warmed up made necessary a continual re-tuning of the "QX" to the original 1550 Kc.

However, the vast improvement in selectivity of the receiver decided me to re-build the unit along sound lines and incorporate it with the second i.f. channel of 450 Kc., as an integral part of the receiver. Consequently, the first of two 450 Kc. i.f. stages already in the receiver was removed, together with its "back-to-back" transformers. The sec-

ond stage was left in circuit to provide the usual source of a.v.c. voltage from the plate of the last i.f. amplifier, the new circuit not lending itself to this application.

As shown in Fig. 2A, the first 450 Kc. i.f. transformer was also left in circuit mainly for convenience in coupling the mixer valve to the Q multiplier, although tests proved that this transformer may also be removed, substituting an r.f. choke for the primary winding and taking the input to the "QX" from the plate of the mixer through the resistor-condenser combination as shown in Fig. 2B.

No difference in performance is noted with either method of input coupling providing that the input impedance, or I should say, the source impedance is kept as high as possible. The series resistor helps in this regard and also serves to reduce the signal input, to the benefit of the following "QX" circuit.

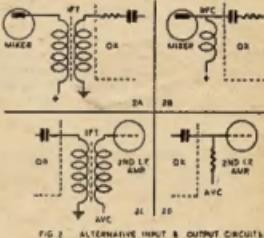


Fig. 2 ALTERNATIVE INPUT & OUTPUT CIRCUITS

The preparation of the tuned circuit LC requires some explanation. The coil L is, as previously explained, one winding from an i.f. transformer. The type of transformer is not important. I have used with equal success, an R.C.S. 450 Kc. winding and a disposals type taken from a No. 11 set.

Remove the shield can and carefully disconnect the two wires leading from the top winding to the soldering lugs at the base. Then, with a hacksaw, cut through the coil former, first making sure that the iron slugs are not in the way. Either of the two windings may be used, whichever is the easiest to mount. It will be noticed that each winding has a condenser already wired across it. This must be removed and its capacity noted. The usual value found in R.C.S. or Crown units is about 50 pF, whereas the No. 11 type has condensers of 115 pF.

It will be necessary to provide this total capacity across the finished coil if we are to tune to the original frequency. Referring to Fig. 1 again, it will be seen that this total C is made up by three separate condensers combining to give an approximately equal amount each side of the feedback connection. In the case of the 50 pF total, these three are as follows: C1 100 pF, C2 75 pF, and C3 a 50 pF. variable set at half capacity. The purpose of this variable condenser will be explained later.

It will be seen that the total capacity across the coil is now back to the original 50 pF. A similar arrangement must be made with any type of i.f. winding making sure that the series combination of C equals the original value.

(Continued on Page 7)

* View Street, Maitland, N.S.W.

† "Simplified 'Q' Multiplier," H. E. Harris, "Electronics," May, 1951, page 130.

TELEVISION MADE EASY

Part vii.—The Carrier Difference System

BY KEN WALL† AND JOHN JARMAN,* VK3ADA

So a television set consists of two receivers on the one chassis, one for the picture or "vision" signals, and the other for the sound. How much cheaper it would be if a single receiver could handle both signals!

Believe it or not, such a receiver can be designed. It is the "carrier difference" receiver, whose operating principle depends upon the use of different modulation methods for the vision and sound signals.

Now we have learnt that the Australian television system will use amplitude modulation (a.m.) for the picture signal and frequency modulation (f.m.) for the sound, so that this type of receiver will be quite practicable in this country. Before we can learn how it works however, we must understand the "outlines" of frequency modulation and how it differs from the conventional system which we call amplitude modulation.

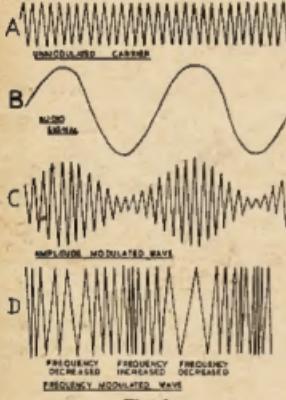


Fig. 1.

Now take a look at Fig. 1, where A represents the waves emitted by any transmitter when it is on the air, but no sound is being sent out (e.g. during an instant when nobody is speaking). This is called an unmodulator carrier. Suppose now that the announcer speaks into the microphone. Fig. 1B represents two cycles of the audio voltage which his voice will produce.

Fig. 1C shows the same waves as A after being amplitude modulated by the audio signal (B). Note that the waves are evenly spaced, but the height or amplitude varies. This method of modulation is used by all broadcast stations and by most Hams.

† 172 Johnson Street, Maffra, Victoria.
* A11426 L.A.C. Jarman, J. B., c/o. A.R.D.U., R.A.A.F., Woomera S., South Australia.

Now note Fig. 1D. This shows the same waves (A) but this time frequency modulated by the signal (B). The amplitude now remains fixed, but the spaces between the waves vary. In other words, the frequency changes. Frequency modulation, therefore, simply means varying the frequency instead of the amplitude, as is done in the conventional system.

Now for a little more detail. Compare C and D of Fig. 1. Note that in f.m., the crest of each sound wave is conveyed by decreasing the frequency of the radio waves and the trough of the same sound wave by increasing the frequency. The louder the sound, the greater will be these increases and decreases in carrier frequency. The number of times per second that they take place is the audio frequency, or "pitch," of the note being transmitted. Still clear as mud?

Then let us take a numerical example. Suppose a carrier of 1,000 Kc. be frequency modulated by middle C, whose pitch is 256 cycles per second. Suppose also that the note be loud enough to make the frequency change by 10 Kc. Our carrier frequency, instead of remaining steady, will now alternately rise to 1,010 Kc. and fall to 990 Kc., repeating the process 256 times per second.

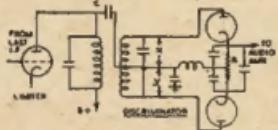


Fig. 2.

Best we now introduce two common technical terms. The amount by which our frequency increases or decreases in each half cycle is called the "deviation", (in this case 10 Kc.), and the total change in frequency in each cycle is called the "swing" (in this case 20 Kc.).

Suppose now that the same note be played softly, so that the deviation is only 5 Kc. Our carrier frequency will now swing between 995 and 1,005 Kc. 256 times per second.

We see therefore, that the louder the sound, the greater will be the deviation, and it is interesting to note that we cannot over-modulate the carrier, as in a.m.

Increasing the deviation, however, produces extra sidebands, thereby increasing the band-width of the signal, so deviation must be restricted, and the Australian Broadcasting Control Board has limited the maximum deviation to 25 Kc. In other words, transmitters must be adjusted so that the loudest sound will not cause the frequency to increase, or decrease, by more than 25 Kc.

An f.m. receiver is a superheterodyne type, differing from the a.m. set mainly in that the detector is replaced by a device whose output is proportional to changes in frequency, instead of changes in amplitude. Two of these devices are shown in Figs. 2 and 3, and we will outline their operation very briefly.

Each uses a modified i.f. transformer in whose secondary winding, two alternating voltages are produced. One of these is induced electromagnetically in the normal way, and the other is fed to the centre tap, in this case through a capacitor C.

Both windings are tuned to the centre value of the i.f. and, if we review our theory of the tuned circuit, we will find that the phase of the magnetically induced voltage must change as the i.f. swings between its highest and lowest values.

Remember, at resonant frequency, a tuned circuit (such as the secondary winding in Figs. 2 and 3) is purely resistive, but when the frequency changes it becomes either a capacitive or an inductive reactor, depending on whether the frequency varies above or below resonance. Our magnetically induced voltage will therefore "lag" or "lead" the centre tap voltage, and by combining with the latter, it produces a surprising effect.

Consider the voltages x and y (Figs. 2 and 3) across the two halves of the secondary. At resonant frequency, they are equal and opposite. When the i.f. increases above resonance, however, y becomes greater than x so that the output voltage (across R) decreases, producing a "trough" of audio voltage. When the i.f. decreases below resonance, x becomes greater than y so that the output voltage across R increases, producing a "crest" of audio voltage.

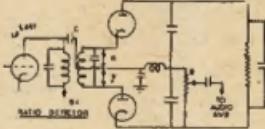


Fig. 3.

The device therefore turns frequency changes into audio voltage, which is just what we require. There is an important difference, however, between Figs. 2 and 3.

In the discriminator (Fig. 2), the output is proportional to the difference between x and y, whereas in the ratio detector (Fig. 3), it is proportional to their ratio. This means that the discriminator will respond to either f.m. or a.m. signals, whereas the ratio detector responds to f.m. only. For this reason, the discriminator, when used, must be preceded by at least one limiter. This is simply an amplifier, operated in over-loaded condition so that it "flattens out" any changes in signal amplitude, thereby making the receiver immune to a.m.

It is by "turning the deaf ear" to a.m. that the f.m. receiver achieves its main advantages over the conventional set.

the most important being elimination of interference. All known forms of interference, including valve hiss and static, cause only amplitude modulation, so that if our receiver responds only to f.m., we will have noise-free reception.

Now, readers who have experimented with f.m. will have their own opinions about this, but we shall not argue, since we are concerned with an entirely different aspect of f.m.

We have "harped" on this subject for a long time, but readers not already familiar with f.m. will agree that it has been quite relevant. The main point we have been trying to drive home is that an a.m. detector (if broadly tuned) will not respond to f.m. signals, and likewise, an f.m. "demodulator" (Fig. 2 or 3) will not respond to a.m., and if this is clear, we are now ready to deal with the carrier-difference receiver.

Consider two signals, on adjacent frequencies; one a.m., the other f.m. By means of a broadly tuned receiver, the two signals can be picked up and handled by all pre-detection stages, without interfering with each other, and separated after detection. This is the operating principle of our carrier-difference receiver, illustrated in Fig. 4, in which the a.m. signal carries the picture detail, and the f.m. signal, on a frequency 6 Mc. higher, carries the sound.

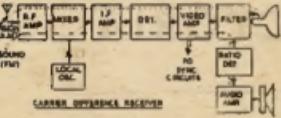


Fig. 4.

Yes, we have combined two receivers into one, to produce a cheaper television set, but why call it a "carrier-difference" receiver? Here's the secret. Whenever two signals, of different frequency, are mixed in a detector, a new frequency equal to their difference is produced. We are already familiar with one example of this, in the mixer, or converter stage of a superheterodyne receiver. In our c.d. receiver the same action takes place in the detector, between the sound and vision if. signals, whose difference will be 6 Mc.

The detector's output, therefore, contains, in addition to the normally detected video signal, a new 6 Mc. signal. Since this is frequency modulated, its value will actually swing between 5.975 and 6.025 Mc. By means of a filter, we can separate this from the video signal (which goes to the cathode ray tube), and by a suitable demodulator (in this case, a ratio detector) we can produce our audio voltage as already explained and convert it into sound by the normal methods.

We see therefore that our audio signal is obtained from the difference between the two r.f. carriers; hence the name "carrier-difference" or "inter-carrier modulation" system, and it should be noted that even after detection, the sound and picture signals can be amplified together, without interfering.

The advantage of this system? Mainly the prevention of fading of sound when the local oscillator drifts. The difference between the two carriers is fixed at the transmitter, so that no matter how much our local oscillator frequency varies, the 6 Mc. signal applied to our filter and sound circuit will remain unchanged.

But why not build a stable local oscillator? We do, or at least as stable as present-day techniques permit, but remember we are handling carrier frequencies between 180 and 204 Mc., so that our l.o. must operate at such a high frequency that even the smallest practicable percentage of drift must appreciably change the i.f.

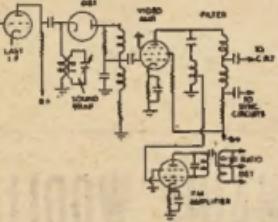


Fig. 5.

Now in the conventional television set we have separate i.f. channels for vision and sound and although each channel is tuned as broadly as practicable, the band-pass of each is limited by the danger of the two i.f.'s. signals interfering with each other, so that a very little change in either i.f. can weaken the output appreciably.

The advantages of the c.d. receiver, where both i.f.'s. can be handled by the same circuit without interfering, should now be quite apparent. The common i.f. circuit can be tuned broadly enough to accommodate the anticipated drifts in frequency, thereby preventing fading of the picture, and we have already seen how fading of the sound is prevented.

Did somebody mention a crystal-controlled local oscillator? Yes, this would work, but it is hardly a commercial practicability, since it would necessitate frequency-multiplying stages, thereby increasing the cost of the receiver.

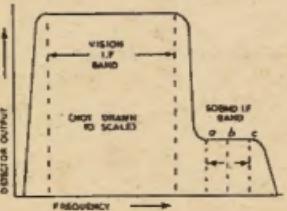


Fig. 6.

A typical circuit arrangement is shown in Fig. 5, which should be studied in conjunction with Fig. 6, which represents the detector output (not the i.f. band-pass, remember).

As an extra precaution against the sound signal interfering with the picture, a sound trap is provided which weakens the sound i.f. before detection, as shown by the "shelf" a-b-c in Fig. 6. This is compensated by passing the 6 Mc. signal, after extraction by the filter, through the f.m. amplifier, which is operated in such condition as to have a slight limiting action since, although a ratio detector does not respond to amplitude modulation, experience has proved that it gives better results when preceded by a limiter.

Note also that if the circuit is adjusted so that the shelf a-b-c in Fig. 6 is perfectly flat, the swinging of the frequency of the sound i.f. (i.e. its frequency modulation) will not cause any change in the detector's output. In other words, our detector is tuned to respond only to amplitude modulation so that the f.m. sound signal cannot interfere with the picture.

To end this "chin-way," we will mention a rather interesting draw-back of the c.d. system. We have already learnt that with negative modulation, the brighter the picture element, the smaller will be the carrier amplitude. Now suppose a scene contained an object so bright that it reduced the carrier amplitude to zero, in other words, cut the carrier (Fig. 7).

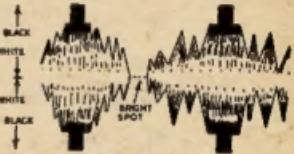


Fig. 7.

Since our sound filter is tuned to the difference between the two carriers, our sound signal is dependent upon the vision carrier, so that cutting the latter must also cut off the sound. Therefore, each time the bright spot is scanned, there will be a short pause of silence, so that our sound will be interrupted at field frequency (50 cycles per second), so that a 50 cycle hum would accompany the sound from the speaker.

The Australian Broadcasting Control Board, however, has taken care of this possibility by limiting the minimum carrier amplitude to 10% of its maximum value, so that transmitters must be adjusted to ensure that the brightest objects televised will not reduce the carrier amplitude below this value.

Having now covered the principles of television, we should be prepared to deal with the subject of interference which, of course, is the Ham's chief concern. This will be the subject of our next instalment.

Manufacturers of . . .

High Grade Woollen and
Worsted Textiles since 1875.

THE CASTLEMAINE WOOLLEN CO. LTD.
CASTLEMAINE - - VICTORIA

★
A G E N T S
I N A L L
C A P I T A L
C I T I E S
★

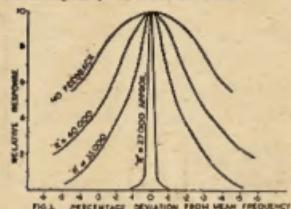
● BLANKETS	● WORSTED SUITINGS
● FLANNELS	● WOOLLEN & WORSTED
● SADDLERY CLOTHS	FROCKINGS
● TWEEDS	● SPORTS COATINGS
● WOOLLEN & WORSTED COATINGS	● SPORTS TROUSERINGS
● WORSTED YARNS	● WOOL TOPS

THE "QX"

(Continued from Page 3)

No restrictions are placed on the actual construction of the unit, but it will be found necessary to shield the coil L if it is in close proximity to other 450 Kc. tuned circuits, otherwise interaction is bound to occur. In my own case the new unit is well removed from other i.f. circuits, the input and output being taken through co-ax leads. This was done to allow the unit to be mounted at the front of the receiver for ease in manipulation of the control knobs on C3 and the feedback potentiometer. However, the mechanical arrangements may well be left to the individual constructor.

Now for the purpose of the variable condenser C3. For purely phone work, this condenser could quite well be eliminated, its place being taken by a fixed capacity of suitable value.



In c.w. reception however, the situation is altered. Normally in receiving c.w. signals, three methods are commonly used, being (a) tuning the receiver to zero beat with the required station and then varying the b.f.o. tuning until the required beat note is heard; (b) Setting the b.f.o. frequency to a value of from 500 to 1,000 cycles higher or lower than the mean i.f. frequency, thereby providing a strong beat note on one side only of the zero setting, the so-called "single signal" method, and (c) Setting the b.f.o. at exactly the i.f. frequency and receiving a beat note of equal strength on each side of zero.

Each of these methods has its drawbacks. In (a) the tedious necessity of jiggling the b.f.o. tuning for each station required; (b) being limited to a beat note on one side of zero only, leaves

no alternative when an interfering signal appears. Personally, I prefer method (c), but the undesirable feature of this method is that the signal, or beat note is received on the side, or skirt of the i.f. selectivity curve, definitely not the receiver's most sensitive position.

Now with the "QX" circuit, the variable C3 permits the variation of the mean i.f. frequency to plus or minus 1 Kc. or more. The procedure is this. Tune in the signal in the usual manner choosing the side of zero beat where QRM is at a minimum as is the usual custom. If the QRM is light and the required signal strong enough it is unnecessary to make any further adjustments, but if the required signal is weak or the QRM solid, as is often the case on our crowded bands, then C3 is moved slightly, peaking the i.f. channel on exactly the frequency produced by the required station. Presto! The wanted signal immediately stands out like a shag on a rock while the interfering station is relegated to the background where it belongs.

For phone reception, the C3 control is left in the centre or mean position. It will be found though, that with the feedback control set at the critical value for maximum feedback, a value of from 25,000 to 30,000 ohms, the selectivity is so high that phone stations appear to be well undermodulated and with a preponderance of bass due to the severe cutting or attenuation of the high frequency sidebands. This cannot be avoided.

ed in any highly selective circuit and it may be necessary to "back off" the feedback control somewhat if audio fidelity is required. This is left to the operator and it is an easy matter to turn a knob, the only operation necessary to change from sharp to broad tuning.

Fig. 3 shows comparative selectivity curves obtained for various settings of the feedback control R. These must not be taken as extremely accurate because of the lack of laboratory instruments, but merely serve to give a good indication of the results which may be obtained with the unit described.

Although the "QX" has been used with equal success at 1550 Kc. and 450 Kc., these frequencies are by no means the only ones on which it may be used, and there is every reason to believe that it could operate successfully at frequencies ranging from the low i.f.s. of 50 Kc. or 100 Kc., right through to the high frequencies if care is taken to avoid phase shift. I intend, at some time in the near future to conduct experiments with it in the range 10 to 30 Mc., where conventional h.f. amplifiers are notoriously lacking in selectivity.

The "QX" should be a distinct advantage to those Amateurs using simple superhet receivers, giving as it does a selectivity comparable to that of a much more elaborate receiver using a crystal filter, with much greater ease of control.

I would be glad to hear from any of you who try this circuit, particularly if experimenting in the h.f. ranges.

A Simple 12 Watt 144 Mc. Transmitter

BY A. H. MORRISBY,* VK7MY

The transmitter described will be used later to drive an 832, which in turn will drive a pair of VT90s (micro-pups).

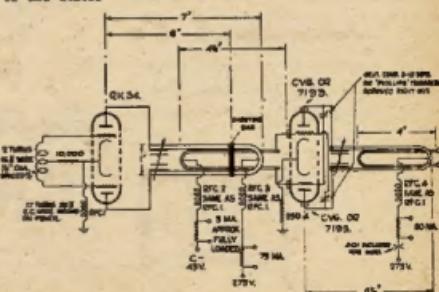
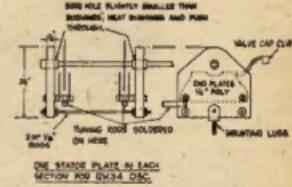
The general construction and layout of the 144 Mc. transmitter circuit is as follows: The chassis size is 22 inches by 7 inches by 4 inches deep, with the RK34 valve recessed through the chassis so that the plate caps are the same height as the CV6 caps. The grid coil is mounted under the chassis on a polystyrene strip. All pillars and insulation throughout are of polystyrene.

The split tuner condensers are made up from standard midgets, by replacing the ends with larger pieces of polystyrene and mounting to the stator plates double spaced at each end, making them part of the plate tank rod as shown in the diagram.

All tuning rods are made of $\frac{1}{4}$ inch copper tubing and coupling can be adjusted by bending the grid rods and antenna rod respectively.

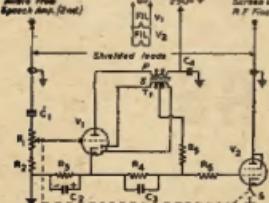
The oscillator stage must be constructed so that all parts and wiring are firm and cannot be jarred out of adjustment.

The remaining details of the transmitter are self explanatory if the diagrams are studied, and the tuning and setting up of the transmitter follow conventional lines.



ERRATUM

We apologise for an error in the Clamp Tube Modulation diagram on page 10 of the February issue. The diode obviously should not be connected to the plate, otherwise high positive voltage would be applied to the grid of V2. The corrected diagram is shown below.



* 48 Central Av., Moonah, Tasmania.

Setting a New Standard in Communication Receivers—

The "Commander" Double Superhet.

Free Data Sheets on Request

Interstate Representatives: West. Aust.—Messrs. Atkins (W.A.) Ltd., 894 Hay St., Perth. Queensland—Messrs. A. E. Harrold, 123-5 Charlotte St., Brisbane. In other States direct your inquiries to firms handling Bright Star Crystals.



Valves, new, boxed, RCA 834s, £1/8/- each.

SC4s, 12/- each.

Limited number of the following Taylor Tubes: TZ20s, £2/16/- each; TB35s, £6/10/- each.

Transmitters altered for Bush Fire and Fishing Boat Work.



CRYSTALS, as illustrated, 40 or 80 mhz, AT or BT cut. Accuracy 0.02% of your specified frequency, £2/12/6 each.

20 metre Zero Drift, £5 each.

Large, unmounted, 40 or 80 metre, £2 each.

Special and Commercial Crystals—Prices on application. Crystals re-ground, £1 each.

BRIGHT STAR CRYSTALS may be obtained from the following Interstate firms: Messrs. A. E. Harrold, 123 Charlotte St., Brisbane; A. G. Healing Ltd., 151 Pirie St., Adelaide; Atkins (W.A.) Ltd., 894 Hay St., Perth; Lawrence & Hanson Electrical Pty. Ltd., 120 Collins St., Hobart; Collins Radio, 409 Lonsdale St., Melbourne; Prices Radio, 5-6 Angel Place, Sydney.

DC11 TYPE CRYSTAL HOLDERS WANTED. ANY QUANTITY.

Screw-type Neutralising Condensers (National type), suits all triode tubes, Polystyrene insulation, 19/6 ea. Prompt delivery on all Country and Interstate Orders.

Satisfaction Guaranteed.

BRIGHT STAR RADIO 1839 LOWER MALVERN ROAD, GLEN IRIS, VIC. Phone: UL 5510.

★ One of a series of technical advertisements devoted to the internal analysis of U.C.C. capacitors.

Capacitor leadership
—from the inside!



Setting a NEW standard

... in design for both compactness and ability to stand extreme tropical conditions, the U.C.C. "Metalmite" is a soundly constructed tubular paper capacitor. It maintains the U.C.C. reputation for high quality, faultless performance, and long life.

1. Solid foil and paper: non-inductive assembly.
2. Non-hygrosopic processing for high performance.
3. Rigid outer aluminium casing.
4. Hemmetic sealing by rubber bung: long leakage path.
5. Vice-like grip of bung on wire prevents disconnections.

Approved to Inter-Services Specification RCS 131.

Metalmite

CAPACITORS

UNITED CAPACITOR CO. PTY. LIMITED
433 Punchbowl Road, Enfield, N.S.W. Telephone: LF 3511
Associated with Tectonic Limited, Australia; and Telegraph Condenser Co. Ltd.,
British Insulated Callender's Cables Ltd., and United Insulator Co. Ltd., England.



Antenna System for General Amateur Use

The following is a description of an antenna system devised by the writer in an attempt to fulfill the following requirements:—

- To be suitable for at least three of the harmonically related Amateur bands.
- To be self-resonant only on the band in use so as to minimise the radiation of harmonics.
- To be fed with a flat line (a small g.w.r. was of no objection).
- The system to be balanced in order to keep the feeder currents equal so as to prevent losses in feed and radiation from the feeders.
- To be as simple and easy to construct as possible.

It will be realised that to satisfy all the above requirements at the same time is almost impossible. However the final arrangement arrived at, which has been erected and tested and which does go a long way towards the ideal, is as follows:—

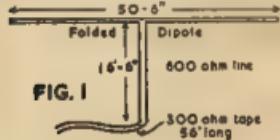


FIG. 1

Fig. 1 shows the dimensions and construction of the antenna. Due to there being a difference of potential between the two antenna wires on 14 Mc. and a slightly lower p.d. on 7 Mc., it is advisable to separate these two wires with small separators about 2" long. The antenna and matching section can be made of ordinary 14 gauge antenna wire. The feed line should consist of 300 ohm tape. The bottom end of the matching section should be held in position by means of a stay wire secured to a short pole or some other fixed object in order not to place any strain on the 300 ohm tape feed line.

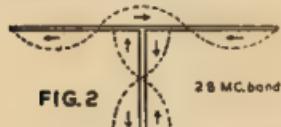


FIG. 2

Fig. 2 shows the current distribution when used on 28 Mc. The system is a one and a half wave length folded dipole with a half wave length linear transformer between the centre of the antenna and the feed line. The radiation pattern consists of four major lobes fairly evenly distributed with minima on the ends and centre of the antenna. The feed point impedance is approximately 350 ohms.

Fig. 3 shows the current distribution when used on 14 Mc. The system is a three-quarter wave length folded dipole with a quarter wave length matching



FIG. 3

section between the antenna and the feed line. The radiation pattern is similar to that of an extended double Zapp and is in the form of a narrow figure 8 at right angles to the antenna. The feed point impedance is approximately 150 ohms.

Fig. 4 shows the current distribution when used on 7 Mc. The system is a half wave length folded dipole with the currents in the bottom one-eighth section out of phase. The radiation pattern is similar to an ordinary half wave dipole. The feed point impedance is approximately 200 ohms.

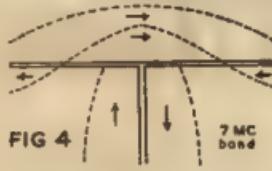


FIG. 4

When used on 3.5 Mc. feeder ends are tied together at the transmitter and the whole system is used as a "T" top Marconi antenna against ground. The feeders should be well insulated throughout their length, which should be such that a current loop or maximum is obtained at the transmitter. The earth wire should be as short and direct as possible and should not be the normal earth wire used for earthing the other equipment in the shack.

If the dimensions are doubled the antenna can be used on 3.5 Mc., 7 Mc. and 14 Mc. as a self-resonant antenna.

The feed point impedances quoted were arrived at experimentally and are therefore very approximate. Due to the slight mismatch between the antenna and the feed line there are standing waves on the feed line but they are not serious.

No difficulty will be experienced in loading the antenna if the feed line is made of multiple or half wave lengths long (56 feet is the shortest length for 7 Mc.). However any length of feed line can be used if provision is made to tune out the reactive component at the transmitter. In most cases a 150 p.F. receiving type variable condenser connected either in parallel or series with the link will be sufficient.

The writer trusts that this antenna will prove of interest and use to other Amateurs and that those who are experimentally inclined will try it out and perhaps suggest some improvements.—ZSIDH. (Reprint from "Radio ZS," May, 1951.)

"ZONE 29 AWARD" ANNOUNCED

A new award for working VK6 stations has been announced by the Western Australian Division of the Institute. The "Zone 29 Award" came into force at 0001 hours W.A. time, 1st January, 1952, and rules are given below.

This new certificate should stimulate interest in working VK6 stations on the various bands and it is hoped that the VK6 Council will be kept busy endorsing and sending out these awards!

RULES

1. The "Zone 29 Award" is issued by the Western Australian Division of the Wireless Institute of Australia to licensed Amateurs throughout the world who satisfy the following requirements:

(a) Establishment of two-way communication with any 25 different Amateur Stations situated in Zone 29. Communication to be after 0001 W.A. time, 1st January, 1952

(b) The total of 25 different stations may be obtained by operation on one or more of the Amateur bands.

(c) Any types of emission which are permitted by the local licensing authority may be used.

2. The certificate will be endorsed when issued as confirmation of fulfilment of the following special conditions:

(a) All 25 stations obtained from operation on one band only.

(b) All 25 stations obtained from operation of phone transmission.

(c) All 25 stations obtained by one-band operation and phone only.

3. Confirmation, in writing, of all contacts must be submitted to the Western Australian Division of the Wireless Institute of Australia, Box N1002, G.P.O., Perth, with sufficient postage to cover cost of return of cards to owner.

EMERGENCY!

Where Amateurs are conducting emergency communications, the following emergency signals will be used and adopted as a standard in VK—

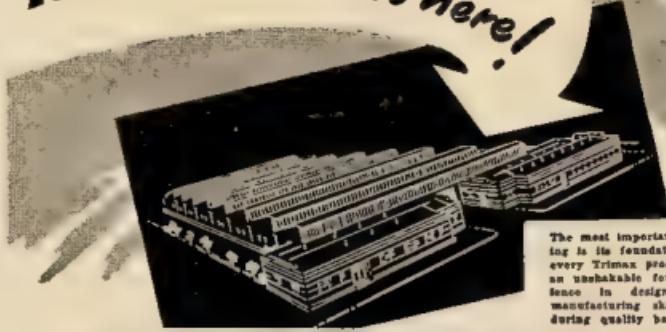
For phone, the words "EMERGENCY TRAFFIC."

W.H.W. the letters "ERRE".
WHERE LIFE AND PROPERTY IS ENDANGERED AND NO NORMAL MEANS OF COMMUNICATION IS AVAILABLE, AMATEURS ARE PERMITTED TO CONDUCT TRAFFIC USING THE ABOVE SIGNALS WITHOUT PRIOR CONSENT OF DEPARTMENT.

A.O.C.P. CLASS

A few vacancies exist in the present class for students desirous of obtaining the A.O.C.P. Persons so interested should communicate with the Secretary, W.I.A. Victorian Division, 191 Queen St., Melbourne (Phone FJ 6997 from 10 a.m. to 4 p.m.), or the Class Manager on Monday and Thursday evenings between 8 and 10 p.m.

TRIMAX *Dependability
Starts here!*



The most important part of a building is its foundation. So it is with every Trimax product . . . built on an unshakable foundation of experience in design, operation and manufacturing skill. For that enduring quality be sure it's Trimax.

TRIMAX TRANSFORMERS

CLIFF & BUNTING PTY. LTD.
Charles St., North Coburg, Melbourne

IMPORTANT!

**BOOK YOUR
ORDER—NOW!**

RADIO AMATEUR HANDBOOK, 1952 EDITION, published by Amateur Radio Relay League, IS DUE TO ARRIVE NEXT MONTH. Price approximately **44/3 d.** and **2/-** postage.

This is a Radio Book no Amateur or Professional can do without

Obtainable from—

McGILL'S AUTHORISED NEWSAGENCY

183-185 ELIZABETH STREET, MELBOURNE, C.I., VICTORIA.

(The G.P.O. is opposite)

Phones: M 1475-76-77

FIFTY MEGACYCLES AND ABOVE

Compiled by J. K. RIDGWAY, VK3CR

NEW SOUTH WALES

The January meeting of the N.S.W. V.H.F. Group was held in an unusual meeting place. At the last moment it was discovered that the usual small lecture room at Science House had not been hired, so the meeting was held in the office of "Radio and Hobbyist", 100 Pitt Street. We were not able to make this last minute arrangement and the entire meeting journeyed by sundry cars to the substitute meeting place. Apologies must be extended to anyone who may have turned up at Science House after the safari had left.

The meeting opened with a lecture by Alan Black, S.Q.W. of A.W.A., who spoke of signal circuits in v.h.f. Rx's. The lecture was of great interest to those present, the subject matter being very topical. Alan covered the design of the various stages, including the "front end" including the cascade push pull neutralized triode, and grounded grid triodes. Comparing some of the commonly used tubes, he displayed a graph showing their relative merits. The GAKS triode was found to have a 7 db noise figure, the 6J4 grounded grid at 3.6 db, and the GAKS triode as used in the cascade, at 3.6. Alan also detailed some figures taken on the performance of the ASBT's Rx's, and the noise figure of the 6J4 and 6AK5. The noise figure at 575 Mc was 15 to 20 db, using an EAGO as a diode mixer without r.f. stage gave 10 db (a similar figure was obtained with the crystal diode). The diode used in conjunction with the lightning tube r.f. stage resulted in a noise figure of 5.6 db.

The lecture was very well received and a vote of thanks enthusiastically carried. Bill SMQ, the Group's recently elected Chairman, put out some high interest pamphlets during the evening, including a specimen of quite a number of tickets for the VK5 Divisional Hamfest.

50 Mc. News: The Ross Hall Memorial Contest ended with some quite astronomical scores, this season having been the best for some years. The 8 Mc band was extremely lively during the contest, but the 50 Mc. band had mostly departed, so have the locals? It would seem that whether we like it or not, she has become a DX band and eventually will be populated by the DXers. This is the characteristic of the band, make it also an ideal local band which could carry all the local traffic which clogs up the low frequency bands—hasn't somebody said this before?

The 13th of January produced a lively general contest with VK5's 3, 4, 5 and 7, plus ZL5 at once. However, since then the band has been very quiet. However, since then the band has been very quiet.

144 Mc. News: During the month, conditions have been kind to those attempting the extended general wave pairs at Bathurst. On one evening in particular the band came unstuck properly and signals were travelling both ways at up to 88. Trevor worked eight Sydney stations and capped it off by making an easy 2W contact with ZL5 in Canterbury. Those in Sydney, making contact with VK5 were ZQZ, 2A9, ZABE, 2A9E, 2A9T, 2H1, using a pair of 6J6s as p.a., EKO and 2ABC 2NS is now using the new 15 element beam and 2A9.

4W1H Forbes found his 282 full of air but was able to obtain a QV07/46 and late news to hand that it is working but not yet on the air. Hugo should put a fairly good signal into the DX zone during the very long path.

ZJW at Orange has at last succeeded in hearing 2NS from home, his previous efforts only meeting with success when he went to the top of Mt. Canobolas. Now, however, has a crystal controlled 1000 and is expecting to pull up in the coming zone shortly.

LADT returned from holidays just in time to join in the scramble during the break

through to Bathurst. Jack has been staying at Urunga and setting amongst the big ones.

2A1Z has a new crystal controlled converter going and seems very pleased with it—last heard of trying to talk to 2W1 into building one to replace the ASBT. Fancy having to talk into one built by one of the 20's.

On the 18th, 19th and 20th the V.H.F. Group ran a contest on 144 Mc with rather novel rules. The operating periods were confined to the hours between 1000 and 2200. This idea proved very popular as these periods correspond to the hours most clubs usually operate. No doubt it proved popular with VK5's also. Thirty-nine stations were operating and things were moving quite quickly. Unfortunately after 2200 hours things slowed down so maybe an even shorter operating period would have been better. Logs have not yet been checked so the results will have to be held over until the next meeting.

The "biggest beam" recently reported (22 elements spaced 10 ft. between centres of the two 16 element sections) is giving its owner EAO a hand headache. The minor lobes are about as bad as mine and the date of the meeting tried has reduced them to any extent. However, Keith seems determined to clear up the trouble and will no doubt do so. The forward gain of the main lobe is pretty tame.

2AWZ has been on the band for many months. No idea where he's been as he didn't say, but it looks like Dicks means business again as he is building a cascade Rx and has re-rectified his 12 element beam.

2W1: "NHS—376 enthusiasts please note: Best appoint a 376 Mc. "souc" correspondent!"—3A9F

VICTORIA

Dates to remember—March 9, V.H.F. Field Day No. 5; March 19, V.H.F. Group Meeting.

Attendance at the January meeting was not up to usual standards, but those present were well catered for by a talk on "Ionospheric Prediction" by Mr. O' Erry of the V.T.R.O. With the aid of sketches on the blackboard, Mr. Erry explained the various layers and their refractive effects on signals of various frequencies, with emphasis on 50 Mc. Mr. Erry also spoke on the generally accepted idea that QSOs with ZL or 50 Mc are the work of sporadic E layer. In order to shed as much light as possible on these as well as other similar phenomena he is most anxious to receive information from whom ever operating on 50 Mc. This is a matter in which we should also, in return, receive much helpful information about possible band conditions.

The C.S.I.R.O. are able to obtain much valuable data by observation of the 32 Mc. aircraft signals since these are continuous transmissions. From these signals on 50 Mc we also includes similar observations on this frequency. It is here that we can help by keeping a note of times when the band opens to a particular spot, when it closes again, and if there are any other similar phenomena on the same or another spot. It is hoped to make available a log sheet to assist you keep these records, but more of this later. Mr. Erry answered many questions and his informal chat with group members was greatly appreciated.

The field day scheduled for the 10th was postponed at the last minute when news of the King's death was received. It was felt that it would not be in keeping with the general feeling of sadness at this great loss. The March 9th meeting will be the 10th and will include some interesting contacts. On that day, a number of VK5's will be operating portable in various parts of the State. A cross-State relay on 144 Mc. is planned and, with our co-operation, the V.H.F. Div. H.Q. at Hobart hope to make contact with the VK5 Div. H.Q. or, maybe even further if that is possible. Amongst the VK5 portable will be TAB at Table Cape and it is anticipated that many QSOs with VK5's will be possible from there. We have already intimated VK5 that we co-operate to the fullest possible extent and are looking forward to an interesting year—VCM.

WESTERN AUSTRALIA

Apart from the local v.h.f. contest held each Sunday evening, the bands have been fairly quiet, although 50 Mc. is still open at times. More interest has and will be shown in 144 Mc. equipment and already several have had great success on 144 or 144.5.

VK5SWL will be operating on 50 Mc from the Royal Adelaide Exhibition and as many stations as possible, city and country, are asked to contact SWL during the operating periods or when heard. In replying, all stations should remember that the receiver will be fed into a

small amplifier and heard by the public. Try not to mix Ham jargon, such as quoting Q signs, in place of the plain language of the log, or the ridiculous saying of hi, hi. At all times contacts must be conducted with decorum. Remember the public will judge you by what they hear.

SWL has been active on 50 Mc in recent still putting a good signal into the city. 5Q9 migrating to the lower bands and antiquated gear, using a 413 kHz oscillator feeding the antenna on 7 Mc. 5JO is a new antenna holder and transmitter to 50 Mc. 5JL has a 1000 watt going on 144, also tries out his bug on 7 Mc. c.w. 5GA should be operative soon, only has three beams erected, 50, 144 and 56 Mc; Col having a spot of trouble, the 50 Mc receives only. He is a recent convert to xtal converters.

WESTERN AUSTRALIA

As there has been no news published from VK5 for some time, it is necessary to report on our activities to keep the public informed. Data. Molo SWL has kindly offered to supply dope for each month's notes and wrote what follows while he was in Bunbury recently.

50 Mc: After several months of comparative quiet, this band came to life with plenty of activity. On 26th November, 4XN was heard at Perth and during the next few days VK5 worked through to VK5L. Numerous operating interests until the Ross Hall Memorial Contest began. During the contest period the band opened from VK5 to VK5 3, 4 and 5 and ZL5 and 50 Mc. No reports from ZL5. 50 Mc. was still opening up to 30th January when these notes were written.

On 4th December, 5HM (Kalgoorlie) and 5BO (Perth) had a solid QSO. On 10th December, 5HM and 5PK (Subiaco) also had a solid QSO. Three days later, 5BO heard 4W0 (Albany) at 5 by 9 in QSO with 5MK whom Molo couldn't hear. On 6th January, SWL and 5PK and reports notwithstanding, were exchanged. The process was repeated both morning and evening on 20th January. A solid QSO should result ere long.

Grapewine Staff: 5IG has a 2 element beam (spicket type) and was heard calling DXL. Ian had a 1000 watt on holidays and missed the Xmas New Year period.

5RK, after months of unrefined noises has borrowed a mike, thrown out an SWB and put in clippings—and now puts out a readable phone signal. Rumour has it that 5RK and 5GB are working the contest really well so we will receive some modulation as a consolation prize! 5LM comes on occasionally and has his friendly growl about not being heard! 5LT "snuck" up to Perth and was hoping to get QSO's with 5PK and 5PK's wife when he arrived. Now, is it the DX or the Xmas spirit that brought 5LW on to 50 Mc? Anyway, Wally was there—and working the DX too. Heard the boys over east calling 5MU (Meekatharra), too, so Max must have been on. 5PC (Perth) had a solid signal to 5PK. Perth and bashed his share of the "breakthrough" also. 5G5, the bloke who lives in the city and travels to Minding for his QSO's, has put up a six m rhombic, aimed at Perth.

5BS' 25 Mc. oscillator hasn't been heard on 50-54 Mc. for a while. SWL will still keep looking for him. 5UD still has been on but John must have grown tired of sitting on a kerb case for he's making a nice-looking rack and desk. He hopes the family will give him a chair. 5LW (Bunbury) has a solid signal to 5PK and maintains the 6SWL 1984 records. They had a friendly tussle in the Contest 6SWL has taken delivery of a larger car—what for? Time will tell. The hole in the band at 50 Mc. is due to SWL taking over during 5BO's holidays—part the time 5EU has been collecting bits and pieces for 6 Mc, Lou makes enough noise on 7 Mc with "no power," so what will he do on 50 Mc, now at Manjimup, should he be able to work through to SWG and 5LT. Hope you'll get on soon, Ale!

544 Mc. SWL took over the 50 Mc. for many months, headed by 5BO and those from SWD, 5FC and 5G9. Haven't been able to raise 5DR, 5G9 or 5AG. 5G5 ("Minding") brought 5BO's 2 Mc signals on the 50 Mc. rhombic. 5DW and 5FC made some very nice contacts on the 50 Mc. the best being just now is 5LO's 3 Mc contact with 5GL (Colonial Light Gardens, Adelaide). signals were R3 53-8, R. Harrington, a VK5 L.W. reported hearing 5BO during this contact.

5KL, Waterloo, has now seems gear on 144, only low power as yet, but it works very nicely. SWG and 5LT also have gear on the band so with the increase in the number of country chaps on the band, there should be some good contacts during the coming months.

50 Mc. W.A.S.

Certificates Additional Number Countries

Call	15	3
VK5WJ	15	2
VK4HRY	15	2
VK5VW	15	2
VK5ELC	1	1
VK5WV	3	1
VK4HXR	5	1
VK5PGO	5	1
VK5JRR	6	1
VK5HTF	7	1
VK5LZ	10	2
VK5XA	11	1
VK5GM	12	1
VK5ACL	16	1
VK1ABC	8	—
VK5WH	15	—

DX NOTES BY VK4OL*

It's a long time since I have heard 14 Mc. so poor in the month of January produced. At times I listened to the band, it was always the same story almost day after day—a dead band. Even the odd Ws, who were coming the long way round in the mornings, had disappeared towards the end of the month. European well one or two round 9 p.m. was the best we could do. Looking at my list, it's been a bad month. Even long distance contacts have been out that is, for good solid signals. Other parts of VK seem to have fared somewhat better, but not UK in expectations.

The bright spot here has been 7 Mc., especially when the cyclone was raging. As the cyclone was at its peak, this band was very good in the mornings, but when the cyclone ceased down, so did the DX on 7 Mc. Evenings on this band were of not much use. The break in this band enabled me to bring the worked total to 98. Others were heard in there.

Static was been troublesome at times as far down as 14 Mc. and seemed to be general on 1 Mc with all DX worked ZDAB told a ZS he could hear practically nothing through it, which was unfortunate from my point of view. The catch of the month for me was VUSAB in the Nicobar Islands. He was VSIED, and as my QSL was posted in Singapore, he has now

* Fit/Lt. F. T. Rine, No. 10 (G.R.) Squadron,
R.A.A.F., Townsville, Queensland.

DX C.C. LISTING

PHONE

Call	No. Ctr.	Call	No. Ctr.
VK3KE	10	VK4WF	15
VK3JD	10	VK3A	11
VK3BZ	10	VK3A-WW	14
VK4KHZ	12	VK4DO	20
VK5KRU	2	VK4FZ	31
VK5KWW	4	VK2ADT	13
VK5KKA	3	VK5HIA	19
VK5VHN	11	VK5PZ	102
VK5DD	6	VK5IC	8
VK5KE	1	VK5GQ	18
VK4WJ	17		100

C.W.

Call	No. Ctr.	Call	No. Ctr.
VICBZ	5 900	VICJJE	21 134
VICKFH	15 173	VICKYD	27 133
VICKHR	8 166	VICKEK	3 182
VICKEL	9 163	VICKFH	31 118
VICKEO	2 153	VICKJL	25 116
VICKCN	1 151	VICKSUM	12 116
VICKSA	28 150	VICKADA	7 113
VICKVW	4 143	VICKPL	36 113
VICKOL	5 142	VICKTL	17 113

OPEN

Call	No. Ctr.	Call	No. Ctr.
VK1BZ	4 913	VK3VQ	46 118
VK4HR	7 187	VK3AWW	45 115
VK4ERU	8 183	VK3JJA	45 114
VK4JE	12 186	VK2ADT	14 113
VK1HG	3 171	VK1CJG	47 111
VK1DI	3 170	VK1ZMM	45 111
VK1KX	7 170	VK4KX	21 110
VK1EW	15 183	VK2ZB	26 110
VK4KL	16 163	VK2ZZ	25 108
VK4DQ	15 157	VK3YL	11 106

apparently left VUS again. One very disturbing note on 7 Mc. is the appearance of Radio Pakistan on 7010 Mc. with a very hefty signal.

The hand survey, with times in GMT, Z time, and stations worked as ".

15 Me.: Have no reports from anybody on this band. TRK has been inactive for most of the month, so has nothing to report. Managed to get across to W myself a couple of times, heard a few others and KRS, but static was the problem most of the time and it was hard to read anything. ZLs varied in strength from night to night.

1 Me. Other than my own activities, there is little to tell of for this band. Evenings were little value, and at all times the band was up early, and as mentioned, the band had to go up here. My listings are VUABAD, VQ554X, KP4DAB at 2100, APAUAK, FA8BD, CR5AE, SU1WPF, C3N8P0, SU1G0, MP8DAM, CR4AE, ZD8AB, K51AN. In addition, he went to South Africa, Europe, and a few V.S. SJE had not been doing much on the band and worked nothing outstanding, but with this XYL away, he intends to try the band a bit harder. SJE was here, having strayed with CR5AE one evening, but Russ does not seem to have heard the same DX as I managed, so SJE was working Europeans that I could not hear when the band went off here.

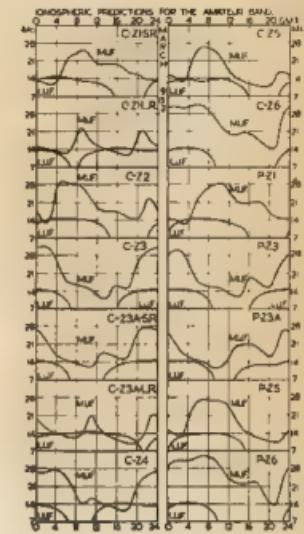
It would appear that a few of the gang are counting the 4UA prefix as a new country. It will be found this is not a country but a prefix allotted to the United Nations and therefore unlikely to appear in a number of countries. For example 4UAJ is in New Delhi, 4UAJ Jamus and 4UAK is in Rawal Pindi. Kasimia is just at the present time a separate country but received a QSL from the United Nations Military Observation Group, India and Pakistan, Field Observation Team, Kotli, Pakistan.

Don't pass up JASU as just another JA station. He is in two Jims. The reason for this is not known to date. EQ3FM looks like one of those guys who promises a lot but follows through with little. He is still not being seen. CT3AA is of a different category, and keeps his promise. On my QSL from ZD1DID he said he is having great difficulty in convincing the other ZD1s that he has really worked them. I am sure he is an amateur extra class operator over there. I am doubtlessly writing my QSL to convince the "doubtfully Thomas" QSL. Don't pass MP4KMF up as another MP4 like 4KL did. His QTH is Kualau.

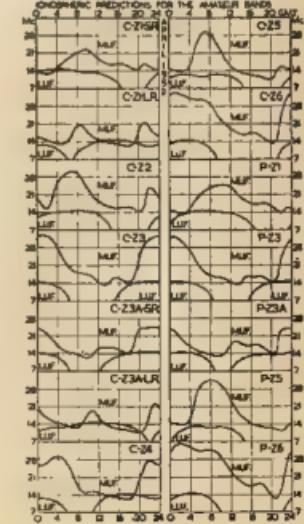
• The thought for the month is an extract from a Woman's Magazine which the XYL put in my lap one day. "Her husband was a

Ham Radio addict and he drove her wild by sitting for hours at the mike while the lawn sprouted paspalum and dandelions. "You think you will get Hollywood this morning," Welsh said. "I've taken out a valve from the set, and I won't tell you where it is until the grass is cut!" What are your thoughts? Cheers and keep the lawns cut, blokes.

AMERICAN CHART FOR MAILED USE



PREDICTION CHART FOR APRIL, 1889



FEDERAL, QSL, and



DIVISIONAL NOTES

Federal President: G. GLOVER (VK4AG); Federal Secretary: G. M. HULL (VK5ES); Box 5411W, G.P.O., Melbourne.

NEW SOUTH WALES

President: John Mylne, VK5LJU.
Secretary: David H. Duff (VK5EO), Box 1734 G.P.O., Sydney.

Meeting Night: Fourth Friday of each month at Science House, Corner Gloucester and Kent Sts., Sydney.

Divisional Sub-Editor: Harry Powell, VK5ATY, 9 Russell Avenue, Wahroonga.

Zone Correspondents: North Coast and Tablelands: Noel Hanson, VK5AH, Ryan Ave., West Kempsey; Newcastle: Ron McD. Stuart, VK5ASJ, 80 Dumbrell St., Stockton; Coalfields and Latrobe: Harry Rawlinson, VK5AL, 1077 Pitt St. Ave., Coonamble; Western: W. H. Stitt, VK5WHL, Cambioblow, Forbes; South Coast and Southern: Roy Raynor, VK5DJO, 42 Pettif St. Yass; Eastern Suburbs: Don Knock, VK5NO, 46 Yenoke Ave., Canterbury; Northern Suburbs: Harry Marshall, VK5AY, 1800 Northgate Ave., Wahroonga; St. George: Chas. Doyle, VK5YK, 84 Carlton Cres., Kogarah Bay.

VICTORIA

Federal President: G. S. C. Semmens, VK5GS.
Secretary: L. R. Bradshaw, VK5SK.

FEDERAL COMMERCIAL INTERFERENCE IN THE 7 Mc. BAND

Many have been the requests by Amateurs for something to be done about the Commercial interference gradually dominating the 7 Mc. band. This matter has been taken up with the Department on numerous occasions, but it appears that very little can be done about it.

It is doubtful whether many Amateurs are fully aware of the full story surrounding allocations in this band and the difficulties any administration would have in taking steps to clear it for Amateur use. The following is an extract from the December, 1951, issue of "QST" on the 7 Mc. band: "An interesting and comprehensive outline of the general problem in this band, and whilst it concerns mainly the effects in the northern hemisph're, it does also give a clear picture of the trend of developments arising from the Cairo (1939) and Atlantic City (1947) Conventions, whereby the 7000 to 7200 Kc. (as used in Australia) in the southern hemisphere is a shared channel."

Australians, like America, preserved portions of the 7 Mc. band exclusively for Amateur use, but it will be observed that the allocation is at the discretion of the national administrations. So whilst we are granted 7 to 7.3 Mc. exclusively as far as our administration is concerned, other administrations permit broadcasting down to as low as 7.1 Mc. How can we win?

Anyway, boys, you read December "QST."

DEFENCE

At 2.30 p.m. on Monday, 4th February, members of Federal Executive received a two-hour talk on the situation in Korea. John G. Goss, Comptroller to discuss proposals whereby Amateurs could be of assistance in any defence plans for times of national emergency.

The W.I.A. proposals were discussed with great interest and these are running high for greater results from this meeting. The accent is one defence—both civil and military—and every Amateur should take steps now to interest himself in constructing reliable portable equipment for use in the civil and defence fields. Don't wait but be prepared for any plan that may evolve. If the Institute is successful in its negotiations it will be the greatest opportunity Amateur Radio has ever had to show what it can and will do.

TRAVELLERS ABOARD

Once again the opportunity has presented itself for Federal Executive to give a letter of introduction to a member of the Institute travelling abroad. This time it is to J. L. (Len) Crooks, VK5KJ, introducing him to the members of the R.S.G.C. in England. Len also passes through Europe, where he has an enjoyable trip and a safe return to his native land.

Don't forget, any time you plan to travel, make out a card to "F.I." through your Comptroller to obtain a letter of introduction to the society in the country in which it is proposed to travel. National contact is a very important thing and does more to cement the bonds of Amateur friendship when done in person than by any other means.

Administrative Secretary: Mrs. S. May, Law Court Chambers, 181 Queen St., Melbourne. Meeting Night: Second Friday of each month at the Royal School, Melb. Technical Editor: Zone Correspondents: Western: C. G. Waring, VK5JW, 12 Skene St., Stawell; South Western: K. O'Rourke, VK5AJR, Killigrew, Werribee; North Eastern: T. K. Tenant, VK5JC, 36 Union St., Geelong; Central: W. H. Follie, VK5GZ, 181 Lemon Ave., Mildura; Eastern: H. O. Kellas, VK5AJA, Tinnabrina; North Western: C. Cuse, VK5ACK, Cumnock Ave., Birkdale.

QUEENSLAND

President: J. H. Farrel, VK4WJ.
Secretary: J. F. Pickles, VK4PP, Box 680J, G.P.O., Brisbane.

Meeting Night: Third Friday in each month at the I.R.E. Rooms, Wickham St., Valley. Divisional Sub-Editor: Jim Cooke, VK4CC, Kurran Street, Chelmsford, Brisbane.

SOUTH AUSTRALIA

President: E. A. Barber, VK5MD.
Secretary: G. M. Bowen, VK5NU, Box 1234K, G.P.O., Adelaide.

SILENT KEY

It is with deep regret that we record the passing of:

VK3VK—Mr. M. Bowen.

ADDITIONS TO DX C.C. LIST

The following countries are now eligible for the DX C.C. List:

Q89—Sri Lanka. ~~Q89~~ — — — — — EA9

St. Paul and Amsterdam ~~Q89~~ — — — — — FB6

Contacts with Newfoundland prior to 31/2/48 will be counted.

W.A.C. AMERICA

Requests have often been received as to how one goes about obtaining the W.A.C. (Worked All Continents) Award. This award is presented by the I.A.R.U. to any Amateur who can give satisfactory evidence that he or she has contacted each of the six recognised continental areas of the world by two-way communication with amateur stations. The main continental areas are: North America, South America, Europe, Asia, Africa and Oceania.

By agreement with the I.A.R.U., the necessity for applicants to forward cards to America is removed by the appointment of an Officer in the Institute to undertake the checking of the verification cards submitted in support of the claim for the award.

An applicant for the award submits his written application, together with his verification cards, to the Secretary of his Division. The Secretary then verifies that he is a financial member and passes the application to the Federal QSL Manager, Ray Jones, VK4AJ, c/o P.O. Box 2614, Tel. Melbourne 3121, who, after checking the verification cards submitted, forwards the application to Federal Executive. The Federal Secretary applies to the I.A.R.U. on behalf of the applicant and the certificate is forwarded out in due course.

A specially endorsed certificate is available to an applicant who makes all six contacts on phone.

When applying please don't forget to give your name and address and return postage for your cards.

FEDERAL QSL BUREAU

RAY JONES, VK5EJ, MANAGER

The QTH of 4U4AJ is Ted Gull, United Nations Radio, Jammu, Kashmir.

Details of the Third All-European DX Competition will be just coming to hand. The Australian section list has come to hand.

The 1952 Australian section list is as follows: 2E0, 3E0, 3E1, 3E2, 3E3, 3E4, 3E5, 3E6, 3E7, 3E8; no VK stations listed.

Writing on 24th November, 1951, GEFTR makes enquiries of Bill Algar, VK5WHL. Writer states that after spending 12 months in Coven-

try and making many friends, Bill left to go to Sweden, but the Coventry gang have had no news of him since. They pass along their best wishes and would like to hear from him.

The Cube Radio Club again send information on to obtain the W.C.A. (Worked All Continents) Award and express the opinion that they have had no VK claimants so far. Princ requirement of the award is having worked stations in C.M.I. 1, 2, 3, 5, 6, 7 and 8 districts. Other requirements can be ascertained from this Bureau.

ZSBHW, who is handling the QSLs for ZSB2MI, operating on Marion Island, advised that ZSB2MI is on from 0400 to 0900 G.M.T. on three Sun days in each month. He uses the following radio frequencies: 14400, 14500, 14600, 14700, 14800. His c.w. frequency is 14600 but unfortunately he prefers phone. He will not answer calls on his own frequency. He will be on Sundays, 10th, 17th and 24th February, then miss a Sunday and be on again Sundays, 3th, 10th and 17th March and on.

Reviewed rules of the Worked All Europe Award are to hand from the D.A.R.C. II. The Editor can and the space, it is proposed to modify the requirements for all awards in the near future.

An interesting batch of cards sighted during January were from EQ5PM, of Teheran, Iran. QSL address, however, is: Sgt. Frank Murphy, U.S. Navy Mission, A.P.O. 1, care P.M., New York, U.S.A.

A correspondent seeks information on VK5PDM who has been heard on 7 Mc. phone stating his QTH is Kaitomoa. Sounds like a "black dot" to me. F.R.S. 195 (Treib) has broken the silence. In addition to performing relief duties at Nthill at end of 1951 and subsequently enjoying annual holidays, Eric has been busy logging stations in the recent N.F.D. and logged 88 QSOs from stations in 12 countries. Eric has been in touch with recent receipt of card from FB5ZZ (1950 SI expedition to New Amsterdam Island). Also repeatedly boasts of having received a card from VK1VU. Must have caught him with his heart very wide open Ireb. You are the "only one" I have heard of possessing such a "treasure".

NEW SOUTH WALES

NORTHERN SUBURBS

There has been little activity in this area since Xmas, though bush fires have caused some excitement in the Hornsby District. Ted Jones, 4U4AJ, a very active member in the B.R.C. here, was completely surrounded by fire when he was extremely lucky to save. Three Hams, among others, arrived to help with the fighting. Recently our Secretary had first in with a few hundred feet of his home. Dave JEO, 4U4AJ, heard of sitting on his beam pole (with a bucket of water!) 2AAJ planning to build a beam for 20 Mc. He had 20 m phone "2AAJ heard after DX on 20 Mc" 2AAJ heard on the air again and was the first member to do so.

It is good to hear some of the v.h.f. gang on the lower frequencies, 2AN7Y and others active on forty. Max 20T, from Broken Hill, called on Dave 2ED on his way through to his new QTH in Newcastle, where a 75 ft. tower will mark the spot. Dave JEO operated portable

2CS gave interesting talk on Double Conversion Receivers.

Notice of Meeting.—The March meeting will be held in Newcastle on Friday 14th. Further details over 2WLT. An interesting evening is assured.

CALIFIELDS AND LAKES

With the continued dry weather in this some the strongest signals seem to emanate from the power tanks which seem to be universal power tanks in the area. 2V20 and 2V21 seem to get in a few contacts on 8 and 20 just to prove that the gear still works but the elements have taken toll of the antenna farm. Bruce 2ALR still displays two serials, but it have not heard him for a few months. The last time 2ALR cleaned up his work bench and found his power supply half re-designed. However, he cannot re-construct the design or where he left off. Bruce is still on the road trip to the river with the paint brush (2EO) plus power. 2ADTT gave the game away (almost) for a whole month and returned much refreshed. Quite an effort to get away with the DX on 10 and so many messages to tell him where it was. Up at Muswellbrook 2AMU is building a new converter for 2V20 and planning portable gear for his holidays in a few weeks time. He is still waiting for 2V21 to set crackling on the air, but Geoff is still very busy with odd jobs round the house. Tim's will-power for you, as he is receiving drive from an external source. No doubt the 2V20's are here. 2V21 and 2V22 boys are hatching something big or lying in wait for a signal to come through on 10. There is little to report from the Lakes area. 2ER has been heard on 10 and 20 and 2V23 has been heard by a power leak greater than ordinary. What are you other chaps doing these days?

WESTERN ZONE

Hast, holidays and no bush fire kept many of the chaps from their shecha As 1 MC was unanswerable for most of the month it was difficult to keep track of all the activity. So far all the gang residing in the Blue Mountains area seem to be in the air. 2V20 at Warrimoo was fortunate as two houses were burnt out on one side of him—14 altogether in the street—glad to see you miss it. Jack 2AZOT was weekend at Vandy Heights, however he is now back home. Belinda 2V21 is still in Dubbo but no call yet. 2AGH has migrated to VK3, we are very sorry to lose Graham. 2V20's main activity centres on 144 where Trevor 2V22 is at the helm. Don't forget OT 2EL of Parkes is heard on 144 only. John 2AMV spends more time in the bathes than the shack.

2V21 went down to Sydney for his usual monthly breakaway. Macmillan 2FO and Trevor 2NA on the way. Ex-ELV of Kintoreena, now a VK3 was back over Xmas and was active with some of the gear he left at home. Rod 2CU journeyed down to the Gold Coast during the holidays, visited 2V21 and 2ALP at Edon on the trip. 2JX of Wentworth Park has a new antenna. Two elements on 80, threatens to describe it for 2ER. 2V20 mainly building, but 2V21 and 2V22 are still active. 2V23 has been heard still trying to work a W in the morning on 40 round the long way, has a couple of QRTs to date, but that is all. New one in the zone is 2ARL, ex-2V11, at Glenbrook, but not heard to date.

VICTORIA

EASTERN ZONE

As my assistant, 2SG, is busily constructing a new p.m. 207 final, once again it is my duty to record our inventively news of this zone. 2RS has had three weeks' holiday stay at Lakes Entrance. Three radio midgets must be carried in the boot. 2B1 and 2A9T still making from 2R600 2PDR using a new rig—p.p. 207s—a full gallon with Class B 207s as modulators. "What's he got?" John 2A9A, a station located at Wooronora, in the hills, would like to receive mail from this end. Also advised that permission has been granted to establish a radio club at the station.

2V20 active on 40 m phone. Doug 2AJE at East Sale is mad with the DX 30 m x 2 R.A.F. Associate Ray Pulford is doing an

advanced course at Ballarat. 2TH will have joined the ranks of the benedictus before this half price. Congrats and best wishes. Gordon and Clarendon 2A9C and 2A9D are still a sponge. The Sale boys 2A9F 2A9G 2GD and company are conspicuous by their absence from the air. 2IO and 2A9T still remain in the air, 2ANCO still quiet. 2TR and 2A9H and 2AGF and 2AMV keeping up the QRM from Morwell and Warragul respectively. 2QZ attended Country Week Bowls in Melbourne in February. Can you think far from the off course? That's about all for the month, but I would like to know how to suppress the remaining sideband when using S.A.L.T. Cheers!

SHREWSBURY ZONE

Once again things have been fairly quiet this month and with the lack of news for this month goes my 1953 New Year's resolutions. 2HG has now got an aircooled petro motor and 2ANCO and 2A9D are now back on the air again. Nell had great trouble with his power supply after condenser when the change was first made. 2AGD spent the other Sunday over at Lake Ginninderra. 2A9H has been on the air. John 2V21 discovered that sailing off an aquaplane at a speed of 50 m.p.h. could be very painful; however, the art of travelling behind a racing speedboat on an aquaplane, was born. John reports the sport we had with a board behind the Landrover around Lake Colac was simply chicken-speed.

N contributors desire to supply blocks for publication in "A.E." It is suggested that they first contact the Editor for particulars as to size, screen, etc.

Nothing heard from the Warrnambool area this month at all, not even from Wal 2JUT. We now have a new member in the area in the person of Graham Nixon-Smith, 2AGH and now 2INV located at Derrimut. Graham's gear is still at his old QTH of Bathurst except for the 2SH 2A which he did manage to bring with him. John 2V21 who you recall that three prefix for quite a while Graham.

Cooling Area—2SW, who has been absent from the air for some time, is planning to come back on 20 m with a 207 final. 2ALP has given the go-by for the time. 2ALP says there is too much QRM so he has gone back to 30 mxx and working some DX on phone. 2AOX is on 20 m and has a 207 final. 2ALP has an RIS on the final and a three element beam on 30 mxx, and is on the look out for 2 m contacts with the Melbourne gang. 2APK is working on 40 mxx quiet DX. 2ALP has also got a new 2M 207s. 2A9L 2ALO is still having a few contacts on 80 mxx. 2B1 has been out portable a bit lately. Bill's 2A1ED is working out nicely on 80 mxx. 2SW is heard occasionally on 20 mxx and 40 mxx. 2ALP has been very active on the 3 mxx band. 2AJT has also been heard on 30 mxx. 2IC not on much but manages

to get into the zone hook-up; his phone is much better with the new mike. 2WT not heard so much now the fine weather is here.

CENTRAL WESTERN ZONE

The hard luck story this month comes from 2ALR of the poor old 2V20. On the 2nd March Day, dozens of CQs were sent out but few contacts made; stations could be heard calling the said portable all day, but n.g., either the Rx was not so hot or the location was wrong. 2ALR is a regular listener to the 20 mxx of 2ARL as usual. Lin picked on the Grampians, which unfortunately have a bad radio reputation.

That "Old Timer" 2HL has discovered over the last few months that he is not the only one who really knows trouble started when the second harmonic decided to swot radio theory—poor old Dad was in a spot, never mind Alan school again. 2ALR is still with the 20 mxx. 2ARM is back with the zone frequency meter calibrating the new Rx, don't pick the wrong harmonic. Bob 2AMW has been a bit off colour with a crook jaw and the "flu" as well as that you want to go to in 2ARL "B."

2TA and 2RR, our two v.h.f. experts, journeyed to "Reid's Lookout" in the Grampians on Sunday 10th March. The purpose of the visit was to work VHF on 144 Mc. However, apart from hearing one carrier early in the afternoon on about 144.6 Mc. for a few minutes, nothing else was heard, but this was own fault. 2QZ, as it looks, is not fit for the job. In place of silence if the v.h.f. chaps did a bit on modulation instead of putting unmodulated signals on the air. 2RR is also running shreds at present. 2M 2A is still active on 20 mxx and 40 mxx, but two-way contacts between Horsham and Melbourne, these v.h.f. blocks are certainly tried, nearly as good as a.s.b. blocks, no hum. 2ARL is appearing to remain in the shadows as he knocked the 2V11's washing down while playing round with an antenna. 2ARL's QRO supply is coming along slowly too the slower the better and the longer are the distances. 2ARL's 2D8 is now quiet but is still very busy on the farm, however he is still slowly moving towards that alleged a.s.b. paradise, the 14 Mc. band. I wonder. Well, we will hear the first west coast hook-up on Sunday, March, 1000 hours on approx. 2108 Kc.

GEELONG AMATEUR RADIO CLUB

The first meeting for 1953 went off in fine style and in spite of the holidays quite a few members attended. The President, Dick 2ALR, was in attendance, as well as the Secretary, Mr. J. Beckingham, who talked on his c.r.o. unit which he had constructed and told the members the details of the work he had done on the design and construction of this unit. Many questions were asked from time to time by the members present to which Mr. Beckingham answered. Mr. Beckingham was also present right at the club and some of the members brought along some of their gear. 2AOL brought his Tx and Rx on 283 Mc. during the evening contact with 2ARL and 2A9L with good signal strength at both ends. Two visitors were welcomed at this meeting.



This photograph was taken by 2DW at the North Eastern Zone's Picnic. From left to right: 2ER, 2PP, 2RZ, 2AJE, 2V20, 2D9W, Molong 2V23, 2V21. In the background is a rig with which Alan 2U1 worked on 2 metres a few minutes later.

Block copy of North Eastern Zone.

QUEENSLAND

TRINAVILLE ZONE (Ex. VENDE)

Ham activity in Townsville was never at a lower ebb than at the present time as one can well learn by listening on 30 m. There once was a time when every night there were cross-town rag-chews when the conditions were understood, now only radio clubs ever have a local rag-chew, even then a rag-chewing session once in a while a local will be on for a night and then high presto, back to other pursuits. One night, for the day, when the local club, 3K9, as it is known, had no regular service, the club was founded, the ship and putting it on a sound financial footing, now all remains of the club is a good bank balance.

4QL was heard again on c.w. the other night being missed or perhaps not heard at this QTH. 4WH still chasing countries on c.w. can be plaintively heard sending CG DX after 6 p.m. (EST). 4AD will be heard on the long path after 4BB bobbed up on the W-LIST, the other Sunday calling CQ - W-LIST, often time, Joe. What about coming on more often any how, and did you manage to hear the VRE calling you on that frequency? I hope the QRM did not spoil it.

MR. heard arguing with 47 PW about which way the South Africans were coming through the p.m. Mr. Stumpjones of whom path answered. Both were using beams. (Maybe I can help out Bob, I worked 13 of 'em with my beam, pointed south and that was the way they had their beams pointed, so I guess they were coming via the short path; just the same, personally wouldn't care to swim the distance. -Sgt. Ed.)

MARYBOROUGH TOWN (2a. 1940)

4SE has settled in and is operating on 7 and 14 Mc. Reports that he has his portable for breakfast. The local gang tried to find him QTH on the fringe of the town, but Siy would not move. He is using a 1000 watt transmitter up near 440. 4AI building 14 Mc. converter and 50 Mc. rig. 4BG also on 50 Mc. gear and has re-built three element beam for 8 mx. Red extended his beam pole for 68 ft. vertical and 100 ft. horizontal while it lasted, after which the pole broke. 4AI and 4BG

40H re-building rig. Having seaside holidays without portable gear. 4KG going back into the R.A.A.F. Arch 4CB worked his 100th country on phone. Only has to get the cards now.

CHARTS: COURTESY

Congratulations to 4FK on being elected the new Federal Councillor. Arthur is a good man. The next Federal Convention is to be held in Sydney. Heard 4J7 back on the air after a short spell in hospital. Sorry to hear that your wife is still ill. You are only again 4RT and would like to get back on a good crystal set to replace the H.R.O. as the number of knobs on the front panel gets really out of hand. I have not heard 4PN on lately. 4TT is again on the air. I have not heard QTH. Tom has re-built and is now running full 100 watts to a pair of 807s. 4RJ and 4IN are still on during evenings, booking for local contacts. 4CT is still on, but not for holidays in N.S.W. and operating portable VICS.

4WD has a simple method of suppressing both side-bands by not switching on the modulator, but very difficult to copy. Bill 4YA is back again after a short holiday in Victoria. Bill spent quite a lot of time at Castlemaine with JND and from all accounts a good time was had by all.

— · · · —

South Australia

Division for January was held in the clubrooms of the representative gathering that we have become so accustomed to, in fact we take the large crowd so much for granted that I feel that we should attend a meeting of one or other of our kindred organizations, and then we might realize that we are very fortunate in having such a roll-up. The guest speaker for the

evening was Clarrie Castle (EKL) and his subject was "Radio Control of Model Aeroplanes". This lecture broke new ground for quite a lot of those present because whilst many of us have had a good deal of interest in the subject we have had very little practical experience. Clarrie tackled the subject in a workmanlike and illustrative manner by bringing along a working model and fully describing its construction, and then giving a demonstration. The audience who had experienced before the job was a success. His talk undoubtedly created interest among the members present as was evidenced during question time and it was also apparent that Clarrie had a good deal of interest in the construction of model aeroplanes, but principally as a problem that Amateur Radio had "locked". He delivered the talk in a very chatty and informal manner and I am sure that he was pleased to hear this type of lecture, the more I am convinced of this. He had a new approach to adopt with a gathering such as ours with its variety of vocations and standards of technical knowledge. Now work Clarrie. The vote of thanks was moved by Mr. G. H. who in his remarks said that he had personally seen the model perform at various times and could vouch for the time and patience that had gone into its construction. The response to the vote of thanks clearly indicated the success of the lecture.

The principal business for the evening was the proposed increase in the annual subscription, and strangely enough no member spoke against it, apparently realizing that the increased cost of everything these days, the increase was inevitable. Quite a number, however, spoke suggesting ways and means of cutting expenses, and some of them, at least, and all these suggestions will be given careful consideration by Council throughout the coming financial year. Federal Executive came in for a few critical remarks from a financial angle, but as I am apparently only permitted to name *F.E.* when praised, I therefore can say no more regarding criticism.

Pride, Gurion, Thomas, Drage, and Pfeiffer, and to all these gentlemen we say come again, you are more than welcome. Reg SRR gave the meeting a brief resume of all that has so far been done in connection with our exhibit in the coming Royal Adelaide Exhibition, and also stated that all exhibitors give some thought to the preparation of a skeleton staff roster, to be in attendance at the exhibit each night. Frank

Received 100 p.c. O.K. except name and report...WELL!!!

(That's probably all he told you anyway)

Don't fool yourself and try to fool the other fellow. Ensure you get the best performance from your equipment by using good quality components.

We endeavour to STOCK all of the requirements for the Radio Amateur including a comprehensive range of Eddystone, Belling-Lane and Bulgin components, plus innumerable transformers, chokes, condensers, and resistors in a wide variety of sizes.

Your Enquiries will receive Prompt and Reliable Attention. See us First!

GERARD & GOODMAN LTD.
"The Home of the Trade"
192-196 RUNDLE STREET, ADELAIDE. **W 1541**

TASMANIA

The main item of interest to report on activities during January was the very successful field day which was held on Sunday, 20th. The field day was organized by Mr. Alan Davies with TRX becoming a 10-minute member. Location was at Bowraville, the Tx being concealed in thick scrub, short distance from the main road and the frequencies used were 2.5 and 144 Mc. The 144 Mc. zone of the burst locating the Tx within 42 minutes from commencement of operation, with TLE filling second place, approximately 37 minutes after TRX's winning burst. Social activities were organized by Honorary Welfare Officer, and a raffle was held, the proceeds being arranged to raise money for the welfare of all kiddies in attendance. A "guess the frequency" competition of a coil and condenser was held and was won by Alan Davies, the frequency being 45 Mc. Guesses of between 20 and 110 Mc. were made by various members; believe TRX was 55 Mc. out in his calculations, much to Joe's dismay. A nail-driving competition for the ladies was held which caused much amusement. Judging from the comments, the field day was very well received and will be held again the annual general meeting on a larger scale and trust more members will participate.

For the benefit of members who have purchased the new V.K.S. a lecture on the importance of them to 144 Mc. will be made by TOM at the April meeting. From reports received, this unit of Bob's, performs remarkably well and his signal should be heard any evening on the band. It seems that the new band with similar bands is 144 and 285 Mc. which is very encouraging in the fact of our need to use all available bands. A party consisting of TRX and TAJ have intentions of going to the top of Mt. Wellington on April 1st in an attempt to set up contact with the north and north-west of the State which we trust proves successful.

Elimination of b.e.t. which has retarded activity by TRX has now been successfully overcome as it seems. Ken will be pounding old b.e.t. units into the ground. TRX is still troubled with similar complaint, while TRM has intentions of a new type serial for the new QTH. Interest in amplifiers has caused a restriction of TNC who mainly work c.w. on 20 m. A new member, Dennis, has shown the absence of TGA from our last meeting; he is now finally settled in the new home at Sandy Bay. Participants in the National Field Day Contest from the south only amounted to one party which was quite understandable from Penna. Lack of interest is attributable to the short duration of this contest, although this we hope will be reviewed before next year and the old times of operating will be available once again.

A temporary loss to TRX in the absence of TRX who had travelled to Japan for an undetermined period. Jack has always taken a keen interest in Institute affairs and was a prime mover in the organization of the emergency network during the last few years. His new intentions are to open a shop in Hobart and sometimes in the future knowing Jack this won't be long. Quite a lot of worry in the form of house building has also kept Jack fairly quiet during the last few months and it is the thoughts of all members of this Division that we hope to see him before we hear the old familiar call again on the Amateur bands.

Northern visitors here for a day or so was TDB, owing to restriction of times, he was not able to visit any members during his stay. Noticed that the new radio equipment was rapidly increasing, what about that license John? Aerials are the main case for discussion with TAL since his recent trip to Becken. No news from TRX concerning what's wrong but he is rather giving that fishing away and having a rather once in a while.

Main business for the February meeting was discussion which included arrangements for an Annual General Meeting to be held on March 25th, concluding with a talk by Mr. Ken Newham entitled "The London Radiotelephony Terminal," which was appreciated by all in attendance. A vote of thanks was passed for the lecture and the meeting concluded at 1000 hours.

NORTHERN TASMANIAN ZONE

Congratulations have been pouring in to TLE from all parts over his magnificent 144 m work now on 50 Mc. up. Yes. Col "Knocked the socks off me" V.K.S. V.K.A. V.K.C. and V.K.S., also all N.Z. districts. New work Col. Now TLE is out for 144 Mc. DX and a 12 element beam now graces the skyline in Knight Street, Launceston.

Another who has been raising beam consciousness is zone president TRX who is contemplating a 3 element on 30 m to raise that elusive zone

needed for W.A.Z. Ray, who has been spring-cleaning the shack, managed to put the works together again and is again active on c.w.

Zone secretary TAN has been holidaying, so missed our February meeting. A visitor from the U.S.A. was present, Mr. W. C. Kelly, who is now living in Launceston and can be heard on 7 Mc. TCL has returned to 7 Mc. after a long absence. TRR, TBR, TTE and THY are not very active at present either because of house-building and other work.

TGM is in the throes of constructing a 190 watt 144 Mc. Tx. In the meantime, Gordon has been very active on 7 Mc. phone despite poor conditions. From TLE comes advice that new 144 Mc. beam is to be put up as soon as possible. TQG is now well on the way to G-land and may have reached there by the time these notes appear.

For our February meeting night TQW brought along a 100-watt power supply Rx for portable work on 80 and 40 m. At our meeting a warm welcome was extended to new Associate Chas Kittman.

Finally don't forget that the March meeting will be held on 144 Mc. and the April meeting will be in the Trades Hall since the old meeting room in the King's Hall Chambers is no longer available.

CORRESPONDENCE

The opinions expressed in these letters are the individual opinions of the writer, and do not necessarily coincide with those of the publishers.

18 Ninmo St., Essendon, W.S. Vic.

Editor "A.R." Dear Sir,

Having been interested in receiver design for some years both commercially and as an Amatuer, I will add interest notes at the foot of page 3 of February "A.R."

I would like to raise some points. I realize that destructive criticism is always very easy, but I feel that the remedy suggested by your contributor is not the best. I would like to add and tends to dodge what may be the main issue.

Firstly what do we understand by "sensitivity"? Surely the only worthwhile measure of this is on a signal-to-noise ratio basis? All commercial receivers are based on this principle and sometimes in addition quote a figure of final output power at which this ratio is obtained: e.g., 2 uv. for 10 db signal/noise ratio or 50 mw. output would be typical.

I submit that as quoted "although sensitive, the receiver was unduly noisy," is a contradiction in terms.

The fact is that in this particular receiver the noise from the 2nd mixer was excessive relative to the receiver noise and this fault was not present or whether there is not some fundamental defect in the design.

It is admitted that altering the 2nd mixer to a triode system might reduce the noise generated by it, but so will many other experiments of varying degrees of complexity. The point is, however, that at those frequencies one should not be seeking to eliminate noise at that stage to the extent where we have to abandon the other advantages of the SKB in the conventional receiver.

With tubes such as the SKB it can be shown that providing there is a voltage gain of about 10 times between the signal source and the SKB grid the noise generated by the SKB can be overcome with the total noise voltage at its own grid.

The assumption is that the first or only valve before the SKB generates a noise voltage, or in its own grid, of about 1 uv. This should be the case in most r.f. pentode with reasonable first circuit design.

Very non-sinusoidal waveform of the SKB oscillator would possibly upset this picture and would be due to excessive feedback in this section. The remedies are obvious.

In the case of the double ended I would say that one should aim for a signal of 20 uv at the 2nd mixer grid and this should be easy even assuming 1 uv. at the aerial terminals, as one would have to assume at least two stages before the point.

A suggested layout might be: r.f. 1st mixer, high L.F. amp, 2nd mixer which should produce a great enough signal to the 2nd mixer grid to make its noise completely negligible. The receiver sensitivity would then depend, as always, on:

1. The performance of the r.f. stage and its associated tuned circuits;
2. The noise generated by the first mixer (same arguments as already set for second mixer stage);
3. The overall bandwidth of the receiver (not here under discussion).

Do not let us confuse gain with sensitivity.

E. H. RANFT, VK3JNR.

18 Victoria Ave., Rose Park, S.A.

Editor "A.R." Sir,

In the V.K.S. monthly notes for February, I included a paragraph which opened with "Federal Executive has been placed on a pedestal by V.K.S. members together with Ned Kelly, three card tricksters, and thimble and pea experts." I have now had time to give the reason for this elevation, together with punning comment on their lack of financial equilibrium. Federal Executive in their wisdom saw fit to order that the red pencil be run through the offending paragraph and add later to the V.K.S. Division, voicing their annoyance. There was no quarrel with this as I did not think for one second that it would be permitted to see the light of day in the magazine, and it had achieved the object in getting under the skin of F.E. which was, after all, the only reason it was written.

However, quite a number of V.K.S. members, who were the instigators of the offending paragraph, have approached me and are suggesting that I have failed in my duty by refusing to withdraw the offending paragraph. What I would therefore, Mr. Editor, appreciate some explanation, however small, from you as to why the paragraph referred to was deleted from the V.K.S. notes and I humbly suggest that in the explanation given to follow this letter in the magazine, all the gentlemen who have been pointing the finger of scorn at me will be convinced as to my definite desire to carry out their instructions, even if it means criticising such an important body.

In closing would like to say that it is my personal opinion that the essential difference between F.E. and an ostrich, is the fact that an ostrich cannot manufacture its own sand.

—WARWICK W. PARSONS, VK3PS.

The paragraph in question was referred to F.E. (as do all others which fall into the same category) and which appears in the policy book, and reads as follows:-

The responsibilities of Federal Council concerning "A.R." shall include:-

- (a) The preparation of Editorials.
- (b) All opinions concerning Federal W.L.A. matters and/or contacts with other bodies.
- (c) Any matter which might prejudice relationships between Divisions or between Amateurs generally."

The matter from which the whole question arises, i.e. the purchase of office equipment, is covered in the minutes of the last Federal Convention. See "A.R." for June, 1951, page 7. Item 9.—Editor.]

HAMADS

9d, per line, minimum 2/-.

Advertisements under this heading will only be accepted from Instituted Members who desire to dispose of equipment which is their own personal property. Copy must be received by 8th of the month, and remittance must accompany advertisement. Calculation of cost is based on an average of six words per line. Dealers' advertisements not accepted in this column.

FOR SALE.—Eddystone 640 S/M 1.32 Mc., excellent condition; this Rx has obtained very high positions in National contests, £60. Wavemeter, heterodyne, British Admiralty G56, 15 Mc.-24 Mc. continuous, new ex-Admiralty, 0.001%, £25. Power Pack, attractive in any shack, brand new 600 watts 200 Ma. D.C. smoothed, 2 x 6.3v. 3 amps, A.C. input 250V. 50 c.p.s., £54 rec., £20. All offers considered, must sell. Call or write: 8 Tivoli Road, South Yarra, Vic.

FOR SALE.—Transmitting and receiving gear; 80 m to 2 m., in excellent condition. B. E. Cabena, 20 Uvadale Grove, Kew, Vic. (Haw. 2571).

WANTED.—A low power Phone/C.W. Transmitter, 40-20 m. L. R. Bradshaw, 9 Grange Rd., Toorak, Vic. (B.I. 1903).

WANTED.—B23 Transmitter and/or Receiver. Particulars and price to N. Culver, Rye, Vic.

★ 3 NEW MEMBERS join the ZEPHYR team!



There is now a Zephyr mike for every need. We announce three of the latest productions now available for immediate delivery through all Radio Supply Houses and Pyrox Distributors. Full technical details and prices are available on application.

ZEPHYR '40' SERIES

ZEPHYR "40" SERIES: A medium priced, high grade velocity microphone with outstanding characteristics which place it in the upper class field of faithful, wide range recording mikes. The performance is very close to the renowned Zephyr "50" series, so well known to broadcast and recording engineers that it needs no amplification here. The "40" series incorporates the latest design techniques and uses exceptionally powerful magnets giving high output and wide range response. Available in 50, 200, 500 ohms and grid impedance outputs. Output approximately -60 db's.

Manufactured by Cunningham Industries Pty. Ltd., Melbourne

C.622



MARKETED BY :

R.H.CUNNINGHAM PTY. LTD.

118 WATTLEREE ROAD, ARMADALE, S.E.3. CABLE "CUNNIG" MELBOURNE — TELEPHONE UY6274

Realism in Sound

Stentorian *Concentric*

DUPLEX *SPEAKERS*



10 INCH

The most advanced and efficient "twin" quality speaker available for domestic use. The concentric Duplex Speaker constitutes two separate loudspeakers, concentrically mounted, each operating independently with its own speech coil gap and diaphragm, embodying the latest application of the well-known series gap magnet system.



SPECIFICATIONS:

50 to 11,000 c.p.s. series gap magnet of Aleomax 3. L.F. gap, 12,000 gauss on 1" pole. L.F. diaphragm of multi-fibre material, graduated cone formation 10" diameter. L.F. speech coil impedance, 3 ohms at 1,000 c.p.s. Flux in H.F. gap 13,000 gauss on 1" pole. H.F. metal diaphragm, convex formation 1" diameter, mechanically protected and loaded by non-resonant central pressure horn. H.F. speech coil impedance, 30 ohms at 1,000 c.p.s. Power handling capacity (both component speakers), 6 watts. Chassis material, pressure die-cast from Mazak 3 non-magnetic and non-resonant alloy.

12 INCH

This quality loudspeaker is of similar construction to our highly successful Concentric Duplex Loudspeakers and combines exceptional quality with large power handling capacity. This is achieved by the use of a very high flux density magnet and special materials for the diaphragm and cone.



SPECIFICATIONS:

Series gap magnet system of Aleomax 3. H.F. gap flux density of 14,000 oersteds. Total magnetic flux 220,000 lines. 1,000 c.p.s. H.F. speech coil impedance, 15 ohms at 1,000 c.p.s. L.F. diaphragm of multi-fibre material, graduated cone formation 12" diameter. H.F. metal diaphragm, convex formation 11" diameter, mechanically protected and loaded by non-resonant central pressure horn. Cross-over network with input impedance of 15 ohms, fitted to loudspeaker chassis. Chassis material, pressure die-cast from Mazak 3 non-magnetic and non-resonant alloy. Frequency coverage: 30-17,000 c.p.s. with bass resonance at 45 c.p.s. Power handling capacity—15 watts.

J. H. MAGRATH & Co. PTY. LTD.

Sole Australian Agents

208 LT. LONSDALE ST., MELBOURNE. Phones CENT. 3688-4414